



MINERAL RESOURCES TASMANIA

A Division of the Department of Infrastructure,
Energy *and* Resources

Annual Review

2001/2002

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Mineral Resources Tasmania

Mineral Resources Tasmania serves the people of Tasmania by the provision of services to the mineral exploration, mining, quarrying and mineral processing industries, and the provision of geoscientific information to all levels of government, the private sector and the community.

— Mission —

- ❑ To contribute to the economic development of Tasmania by providing the necessary information and services to foster responsible land management, and mineral resource and infrastructure development, for the benefit of the Tasmanian community.

— Objectives —

- ❑ Benefit the Tasmanian community by an effective and co-ordinated government approach to mineral resources, infrastructure development and land management.
- ❑ Maximise the opportunities for community growth by providing timely and relevant information integrated with other government systems.
- ❑ Optimisation of operational performance by MRT by developing the organisational structure to support the Whole-of-Government business processes.

— Activities —

Activities within the Division include:

- ❑ Collection, integration, interpretation, publication and presentation of geoscientific information.
- ❑ Collection, integration, interpretation, publication and presentation of information promoting Tasmania's mineral resource potential, and land stability and groundwater issues.
- ❑ Issue of legal titles to mining tenements, collation and recording of statistics relating to mining production, collection of fees and rentals, management of royalty regimes, and recording of mining tenements.
- ❑ Regulation of mineral and petroleum exploration in Tasmania, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore exploration.
- ❑ Environmental appraisal, monitoring and management of mining heritage and land access issues.
- ❑ Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.

— Major Issues and Initiatives for 2002/2003 —

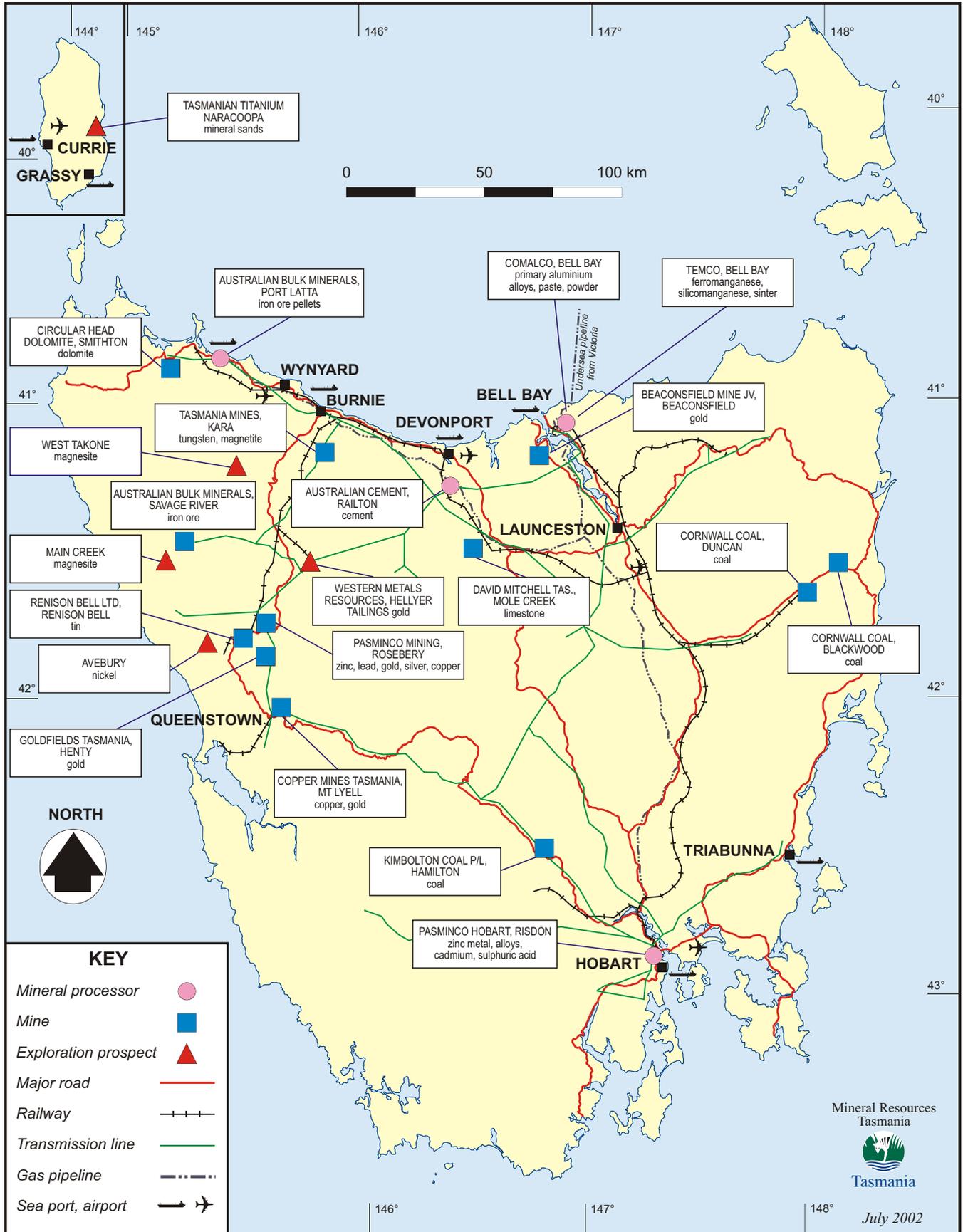
- ❑ Complete Project TIGER.
- ❑ Complete the Western Tasmania Regional Minerals Program study.
- ❑ Complete construction of the lapidary laboratory at the Mornington Core Store.
- ❑ Continue activities relating to the cultural change program.
- ❑ Continue assessment of royalties to ensure compliance with the *Mineral Resources Development Act 1995*.
- ❑ Continue rehabilitation of abandoned mining sites in Tasmania.
- ❑ Enhance provision of geoscientific data through the TIGER system.
- ❑ Produce a series of planning information maps (including data on land stability, groundwater, construction material sources, and mineral prospectivity).

CONTENTS

Mineral Resources Tasmania — Divisional Overview	5
Financial performance	10
Performance indicators	14
Review of MRT Branch Activities, 2001/2002	17
Metallic Minerals and Geochemistry	17
Industrial Minerals and Land Management	22
Engineering Geology and Groundwater Section	33
Information Systems and Geophysics	35
Data Management	39
Publications	39
Library	41
Mineral Sector Overview	42
Value of the Tasmanian mineral industry	43
Mineral exploration expenditure	45
Metal prices	46
Review of Mineral Sector Operations	47
Metallic minerals	47
Industrial minerals	55
Ceramics	56
Construction materials	56
Fuel minerals	59
Mineral processing operations	60
Annual Report, Rehabilitation of Mining Lands Trust Fund	63

Tasmania

Major Mining and Mineral Processing Operations



Mineral Resources Tasmania

— Divisional Overview, 2001/2002

The financial year 2001/2002 produced mixed results for the minerals industry in Tasmania, but saw a number of successes for MRT due to staff initiatives following consultation with various client groups. Numerous other improvements have occurred in MRT's work practises due to the progressive implementation of the TIGER system, which allow us to provide better service to end-users of Tasmania's geoscientific data. As in past years, I wish to thank all MRT staff for their continuing high quality of commitment and outputs which are allowing the Division to help fulfil government policy.

MRT successes during 2001/2002 included:

- Following the proclamation of the *Mineral Resource Development Act 1995*, a dispute resolution process has been developed to allow objectors to exploration licence applications to have access to a mediation process outside the established formal court system. Officers from MRT meet with the objectors and explorer, where the legal position is explained, followed by a presentation of the planned exploration program and the objectors concerns. In over 95% of the approximately fifty mediation meetings held to date the objectors concerns have been resolved by setting extra conditions for the exploration licence, to the agreement of all parties.

During 2001/2002 recognition of the success of this process came from the Tasmanian Conservation Trust, which expressed its appreciation directly to the Minister for Mines. In the past year the other Australian mining jurisdictions and New Zealand have inquired about this unique community level mediation process and a paper has been written for distribution. The paper was also recently sent to an NGO involved in coal mining matters on the mainland after hearing about Tasmania's new dispute resolution system.

- The development of a map series designed to transfer geoscientific information in an easily understood format to land-use planners. This map series, available in both digital and print-on-demand formats, was derived following requests by local government, both inside and outside of the Partnership Agreements process.

The information will allow local government, and land and infrastructure planners, to make informed decisions relating to development, zoning and land-use activities. The maps will include information on land stability, groundwater resources, construction materials, mineral prospectivity, location of mines and quarries, and location of current exploration licences and mining leases.

The project has progressed to a stage where maps showing construction material locations, mineral resources and tenements, and land stability information are available. Maps showing groundwater prospectivity will be available in the near future.

- In response to the Regional Forests Agreement (RFA) and the Resource Planning and Development Commission (RPDC) Comprehensive and Adequate Reserve Inquiry, MRT instigated the Geographical Information System-based project *Tasmanian Exploration Auditing and Monitoring System* (TEAMS), to develop a recording system of on-ground exploration activity. This system allows compliance auditing of the *Mineral Exploration Code of Practice* and, in the longer term, outcome-based auditing of the environmental effects of exploration in Tasmania.

All work programs, whether on Crown Land, State Forest or private property, are entered on this system to give a complete record of all the environmental information relating to exploration. The system has also been designed to provide ongoing information on the outcomes of rehabilitation of exploration

activity. Compliance auditing of this system requires verification that the agreed approval process is adhered to and that derived statistics reflect the RFA and the recommendations of the RPDC.

- Following the agreement for conducting the Western Tasmania Regional Minerals Program (WTRMP) two of MRT's branches undertook a consultative program with representatives of the minerals industry to develop proposals for a variety of activities under the WTRMP.

After acceptance of the WTRMP projects, further consultation with mineral companies defined the type of products that were required to get new exploration programs up and going. The result has been the acquisition and release of geoscientific information that has been universally welcomed by the minerals industry (as recently demonstrated to the Minister in Perth, WA), as highlighting the opportunities available for explorers in Tasmania.

The resultant 'value added' products that MRT has developed from the WTRMP data have significantly increased interest in Tasmania's exploration potential and are already providing assistance to contractors with their interpretive work. The products were derived from considerable internal co-operation and the contributions of people across a number of branches. This is a good example of internal responses to external needs by existing clients, which will also help to attract potential new clients/end-users.

Regrettably, the mining industry in Tasmania continued to experience difficult conditions during the year, with low commodity prices and, in a number of cases, the mitigating effect of the low Australian dollar being offset by company hedging arrangements.

Pasminco and Allstate Explorations NL were placed in the hands of Administrators during 2001 and Beaconsfield Gold NL was placed in the hands of a receiver. Nonetheless, both the Rosebery zinc and Beaconsfield gold mines continued to operate and there was substantial improvement in the performance of both mines.

By the end of 2001/2002, some metal prices had started to recover and the short-term outlook had improved. Exploration of the Avebury nickel deposit by Allegiance Mining NL continued to be successful, with the company raising capital for a drilling program to define resources to a stage at which a decision to proceed with underground development could be made. AurionGold continued to obtain promising intersections of gold mineralisation near the Henty mine, which promise to significantly extend the mine's life. Overall levels of investment in mineral exploration remained low.

The Thylacine gas discovery in permit T/30P and the Yolla gasfield are both in Tasmanian waters and are to be developed. The gas from both these fields will be piped to Victoria.

The major issues affecting MRT in 2001/2002 included:

- Progressing Phase Four of Project TIGER (Tasmanian Information on Geoscientific and Exploration Resources) within the given time frame and budget.
- The implementation of the recommendations of the first phase of the Western Tasmanian Regional Minerals Program using funds allocated by the Commonwealth for this purpose.
- Provision of an appropriate level of resources for environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.
- Completion of the Core Library extension

Promotion of mineral and petroleum potential

MRT staff prepared and attended a promotional booth at the *Mining 2001* exhibition and conference in Melbourne in November 2001. The display highlighted the new geophysical data being acquired under the Western Tasmanian

Regional Minerals Program, and the event was successful in attracting a new exploration company to Tasmania. Promotional material was also presented at a booth at the Prospectors and Developers Association of Canada (PDAC) meeting in Toronto in March 2002. As part of the visit to support the booth, two MRT staff members visited ten mining and two finance companies in Vancouver and Toronto as part of an Australian delegation, as well as having a meeting with the editor of North America's leading industry newspaper, the *Northern Miner*. The latter meeting resulted in favourable publicity for a company's Tasmanian exploration program.

Four offshore petroleum areas were released for bidding in 2002. These areas, in the Sorell Basin off the west coast and in the Bass Basin to the north of Tasmania, were actively promoted at the American Association of Petroleum Geologists conference in Houston (USA) and at the Australian Petroleum Production and Exploration Association conference held in Adelaide in April 2002. Bids were received for two of the 2001 release areas.

Collection, integration, interpretation, publication and presentation of data

Development of Project TIGER Phase 4 resumed early in the year. The MRT website was physically relocated to allow a greater range of client information to be hosted and the site reconstructed using a content management system. An Internet tenement information system, which includes a map viewer and spatial search facility, provides a valuable research tool for a range of MRT clients.

In conjunction with the Western Tasmanian Regional Minerals Program, document viewing and download facilities are being added to the previously developed document searching facility. This allows remote clients to view reports and documents held by MRT. Development of a spatial data editing system is in progress and tenders for the creation of a geoscience data model close in early July 2002.

The collection and presentation of information on Tasmania's mineral wealth and geoscientific nature continues. Fifteen 1:25 000 scale geological maps were prepared for digital capture compared with the target of twelve sheets, and data capture/output was completed for twelve of these areas. A significant amount of work was undertaken in the preparation of a seamless 1:250 000 scale digital geological compilation of Tasmania.

Because priority was given to field checking of Western Tasmanian Regional Minerals Program geophysical data, primary geoscientific data acquisition was suspended for the year. Compilation of four sheets, on which fieldwork was finalised during the previous year, was completed during the year.

The 1:500 000 scale digital *Groundwater Prospectivity Map of Tasmania* was revised as part of the Groundwater Prospectivity of River Catchments project. A 1:100 000 scale digital map of the Great Forester River catchment area was produced. Six detailed digital maps of slope stability of the Tamar Valley region were produced.

Recent developments in regional land stability hazard assessment have been designed to allow the incorporation of data into quantitative risk assessments for planning purposes. MRT is in the process of developing and testing a methodology for land stability hazard assessment that will be used to maintain the uniformity of future hazard mapping. A predictive GIS-based system is being developed, with known areas of instability being used to test the methodology.

Western Tasmanian Regional Minerals Program (WTRMP)

A Reference Group, with an independent chairman and members drawn from the Tasmanian Minerals Council, the Department of Industry, Science and Resources and MRT, developed a series of projects to implement the geoscience infrastructure recommendations of the *Final Regional Development Plan* of the Western Tasmanian Regional Minerals Program.

Aeromagnetic and radiometric data acquired over King Island and western and northwestern Tasmania were released in October 2001 and promoted at the *Mining 2001* and PDAC 2002 conferences. The data have provided a new insight into the geology of the area and form the basis for a number of value-adding sub-projects. Helicopter-based acquisition of approximately 15 600 line kilometres of electromagnetic data over several areas of western Tasmania was completed in April 2002, with the initial data considered of high quality with excellent information content. Field checking of the geophysical data has commenced, and includes four projects involving contract geologists. Two of these were completed by the end of the year.

The collaborative study between MRT, Geoscience Australia and the National Centre for Petroleum Geology and Geophysics to improve the knowledge relating to the petroleum potential of the offshore Bass and Sorell basins continued during the year. The results of this study were launched at the Australian Petroleum Production and Exploration Association conference in April 2002.

The technical documents relating to onshore and offshore exploration, and MRT technical reports, are being scanned to allow on-line viewing on the Internet and downloading for local viewing or hardcopy production. On-line viewing was enabled in March 2002, allowing MRT clients from throughout the world to view or print open file technical documents held by MRT at their own location.

Setting and monitoring of standards for exploration activities

MRT is responsible for ensuring that all exploration activity in Tasmania achieves the highest environmental standards and complies with the *Mineral Resources Development Act 1995* and the requirements of other legislation which protects, for example, threatened species and cultural heritage. The fourth edition of the *Mineral Exploration Code of Practice* outlines the current requirements, the approvals process, and the controls and monitoring procedures that MRT has in place.

During the year twenty-nine exploration work programs were submitted to and approved by MRT. Of these ten were in reserves derived from the Regional Forests Agreement (RFA) and required assessment by the Mineral Exploration Working Group.

Rehabilitation of Mining Lands Trust Fund

The funding to rehabilitate abandoned mines comes from an agreement with the mining and quarrying industries whereby a proportion of the royalty increase introduced in 1995 was to be allocated for rehabilitation.

In 2001/2002 major works were completed at abandoned mines near Gladstone in northeast Tasmania, and at Merrywood near Royal George. Erosion control and revegetation works were carried out at the Endurance mine, while regrading, cultivation and revegetation works were completed at Merrywood. A safe viewing area was constructed at the Blue Lake at South Mount Cameron, in partnership with the Parks and Wildlife Service.

Smaller scale works included revegetation at Melaleuca, drainage control at the Lake Johnston Nature Reserve and gorse spraying at the Queensberry mine near Zeehan, as well as the capping of abandoned mine shafts at Bangor and in the Zeehan area.

Special initiative — Core Library

The upgrade of the core inspection facility was virtually complete by the end of 2001/2002 apart from the completion of the inspection benches, which will be achieved in early 2002/2003.

Royalty assessment

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is not a tax but a payment to the community for the purchase of the State's non-renewable resources.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered system where royalty is paid on the net sales and profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation. Mine and quarry inspections are also undertaken by Inspectors of Mines to determine the quantity of material taken from a tenement.

Mineral royalties totalling \$7.9 million were collected during the 2001/2002 financial year, a decline from the \$10.7 million collected in 2000/2001. The 2001/2002 financial year proved to be difficult for some Tasmanian mines, with commodity prices generally remaining low, although the gold price did improve during the year.

Centre for Ore Deposit Research, Special Research Centre (CODES-SRC)

Funding is provided to support CODES-SRC at the University of Tasmania in conjunction with the Commonwealth Government and industry. The allocation is used to part-fund honours scholarships, and thus helps increase the knowledge of Tasmanian geology, particularly in the important fields of economic geology and mineralisation. The MRT Library receives a copy of each thesis, which is available for reference use.

Dr A. V. (Tony) Brown

*Director of Mines and State Chief Geologist
Mineral Resources Tasmania*

Financial Performance

Detailed financial information on the operations of Mineral Resources Tasmania is published in the Department of Infrastructure, Energy and Resources Annual Report to Parliament.

The 2001/2002 consolidated fund appropriation to Mineral Resources Tasmania was \$5.215 million. This funding consisted of:

- \$3.004 million for salaries for 52 full-time-equivalent staff;
- \$1.793 million for operating expenditure including rent; and
- \$418,000 for administered payments (\$350,000 Restoration of Degraded Mineral Lands and \$68,000 grant for the Tasmanian Government Mining Scholarships at the University of Tasmania CODES-SRC unit).

MRT's consolidated fund appropriation remained unchanged from 2000/2001 except for salary indexation negotiated under the State Service Wages Agreement, which is funded by Treasury.

Funding was also granted for the completion of the TIGER project, with \$1.5 million being allocated over two years from the Infrastructure Fund.

MRT continues to keep a tight control over expenditures to ensure that the Division gets good value for its limited funding, despite the rising costs in delivering the outputs. A number of initiatives were undertaken during the year to try to reduce expenditures to enable programs to continue. The Information Services branch, which is responsible for information technology (IT) at MRT, undertook a full review of IT needs and was able to rationalise some IT expenditure by consolidating servers and reviewing software requirements, which will save costs associated with software maintenance in the long term. A full review of motor vehicle numbers was also undertaken, with the types of vehicles used also being reviewed in order to improve running costs and resale value whilst still meeting business needs.

Tasmanian government agencies are funded on an outputs basis. The outputs represent the goods and services provided by MRT, and the cost of delivering those services. The government purchases these goods and services to meet policy objectives. Mineral Resources Tasmania has two outputs.

Outputs — Application of Funds, 2001/2002

	<i>\$'000</i>
1. Minerals exploration and land management	2,724
2. Tenement management of the exploration and minerals industry	2,073
Administered payments	418
Total	5,215

Descriptions of Outputs and Outcomes, 2001/2002

1. Minerals Exploration and Land Management

This output covers:

- the provision of geoscientific data and resource information on Tasmania's metallic, industrial, and hydrocarbon mineral endowment;
- promotion of mineral potential for the stimulation of exploration for metallic and industrial minerals and hydrocarbons; and
- geoscientific database development, maintenance, output and marketing, including the production of digital geoscientific maps and associated databases.

This will have the resultant outcome of dynamic minerals exploration and land management for Tasmania and offshore waters.

2. Tenement management of the exploration and minerals industry

This output provides for:

- the provision of geoscientific information essential for the effective and sustainable management of land and mineral resources;
- provision of advice to all levels of government and the public on land management issues;
- administration of mining legislation, including the issue of legal titles for mineral tenements;
- collation and recording of statistics relating to mining production and exploration; and
- the demand and monitoring of the collection of fees, rentals and royalties.

This will have the resultant outcome of effective and efficient tenement management of the exploration and minerals industry.

Mineral royalties and Departmental fees and charges

Mineral Resources Tasmania collects royalties and rents and fees from mineral lands. These revenues are forwarded directly to consolidated revenue and are not available to MRT.

Royalty revenue for 2001/2002 was \$8.0 million, which was a reduction from the \$10.7 million collected in 2000/2001. The estimated royalty collection for 2001/2002 was \$10 million but was not met due to a number of factors affecting sales revenue and profitability of the major metallic mines. Individual mine reports in this review discuss production and profitability.

Base metal markets were generally all weaker in 2001/2002, with gold and iron ore being exceptions. The value of the Australian dollar was lower, which helped make up some ground lost by commodities priced in United States dollars. Whilst Australian dollar commodity prices have been bolstered because of the low dollar, some companies have suffered due to hedging programs that have not allowed them to take advantage of the favourable exchange rate. As the royalty regime does not include hedging gains and losses in the calculation of royalty, these arrangements do not affect the royalty revenue to government except in regard to the ability to pay.

Mineral Resources Tasmania also collects rents and fees from mineral lands, which are forwarded directly to consolidated revenue.

Rents and fees from mineral lands raised \$0.835 million in 2001/2002, which was an increase from the previous year. The additional revenue is a result of the higher average area of licence size, increased dealings, and the Duke Energy gas pipeline licence.

Sales of maps and publications were below budget due to the effect of some MRT maps and data being available for download via the Internet. Maps and data are also made available free to other agencies as well as stakeholders under partnership agreements. The downturn in the exploration industry also has impacted on demand. The budget has been reviewed in line with outcomes of project TIGER.

	<i>Target 2001/2002</i>	<i>Actual 2001/2002</i>	<i>Target 2002/2003</i>
Royalties (\$,000)	9,000	7,987	7,000
Rents & Fees (\$,000)	747	835	747
Sales of Maps and Publications (\$,000)	25	18	15

Royalty regime

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is not a tax but a payment to the community for the purchase of the State's non-renewable resources.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered system where royalty is paid on the net sales and profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

The two-tiered metallic and coal royalty consists of an *ad valorem* percentage payable on net sales, and a formula-based percentage of profits. This system requires mining companies to pay a fixed percentage of sales in royalty for ore extracted, and allows the community to benefit further in good times when a company is making a profit.

Following negotiations with the mining industry, new royalty rates were approved in August 1997 with the regime taking effect from 1 July 1997. Non-metallic rates increased from \$1.00 per cubic metre to \$1.20 per cubic metre, while it was agreed that metallic minerals and coal royalties would be increased incrementally over a number of years.

The *ad valorem* rate for net sales is 1.6%. The profit component of the royalty regime is calculated via an exponential formula which increases the percentage of profit royalty paid as the mine's profit increases.

A royalty cap of 5% of net sales has been set so that high-cost, short-life mines are not discriminated against.

Mining companies that expand into downstream processing to produce a near pure specific metal can apply to the Treasurer to receive a 20% rebate on royalties payable. Companies that produce gold doré can apply to claim a 10% rebate on royalties.

The Treasurer has the discretion to increase the gold doré rebate to 20% depending on criteria such as the magnitude of investment undertaken and the benefit to the Tasmanian economy from the investments.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the Legislation. Mine and quarry inspections are also undertaken by Inspectors of Mines to determine the quantity of material taken from a tenement.

Major contracts awarded (over \$50,000)

<i>Contractor</i>	<i>Location</i>	<i>Tender</i>	<i>Period of contract</i>	<i>Estimated value of tender (\$)</i>
Maveric Builders Pty Ltd	Hobart	Core Library — display area	3/08/2001–3/12/2001	57 149
Becketts Heavy Plant Hire Pty Ltd	Exeter	Merrywood rehabilitation earthworks	25/02/2002–current	90 750
Coffey Geosciences Pty Ltd	Hobart	Taroona land stability	8/11/2001–8/05/2002	55 000
RJ Welsh and Sons Pty Ltd	Hobart	Relocation of lapidary laboratory	30/04/2002–current	102 598

Consultancies awarded

<i>Name of Consultant</i>	<i>Description of consultancy</i>	<i>Value of consultancy (\$)</i>
John Bamford & Associates	Services provided to locate & level boreholes at Casuarina Crescent, Berriedale & Flinders Esplanade, Taroona	550
Nigel Bedford	Design and supervision of Merrywood rehabilitation	7,100
Thompson & Brett	Design and supervision of shaft caps at Zeehan	6,350
Land Management & Rehab Services P/L	Rehabilitation at Merrywood coal mine	6,720
Baynes Geologic	Landslide hazard software development/testing	33,000
Pitt & Sherry	Review of landslip monitoring data and draft report	15,840
Leaman Geophysics	Seismic risk report, McRobies Gully	880
R. Whittacker	Project methodology	2,750
Baynes Geologic	Landslide hazard assessment	17,600
Wise Lord and Ferguson	Project TIGER: Business Improvement Consultancy	37,500
Rob Yeates and Associates	Australian Bulk Minerals royalty	10,000
Pitt & Sherry	Review of report, Taroona landslide	2,376
Peter Binny Surveys	Regional survey of landslips	3,850
John Miedecke & Associates	Storys Creek survey	2,500
Thompson and Brett	Engineering for shaft covers at Zeehan	5,772
Nigel Bedford	Civil engineering for Merrywood rehabilitation	9,500
Land Management & Rehab Services P/L	Revegetation consultancy for Merrywood rehabilitation	6,109
Oracle Corporation Australia Pty Ltd	Project TIGER: Oracle Portal implementation enhancement	25,000

2001/2002 Performance Indicators

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Exploration activity is underpinned by updating and providing high quality geoscientific data relating to Tasmania's mineral resources. The activities of MRT are directed at the capture, storage and promotion of such information, with the increased availability of this information being measured and correlated with exploration investment. Enhancement of geohazard information is also of high importance to stakeholders of MRT, as is the effective administration of MRT's regulatory framework.

Achievement against internal targets

<i>Action</i>	<i>Target</i>	<i>Result</i>
Provide new data in areas with inadequate geoscientific coverage.	1. Collection of at least 200 km ² of primary digital geoscientific coverage per year. 2. Production of digital geoscientific coverage of ten 1:25 000 scale map equivalents per year.	1. No primary digital geoscientific coverage collected; resources utilised on WTRMP interpretation. 2. Twelve 1:25 000 scale maps produced. Work on seamless 1:25 000 scale coverage of Tasmania continued.
Research and promotion of exploration of Tasmanian petroleum basins.	Promote one offshore area per year.	Seven offshore areas released and promoted at the APPEA and AAPG conferences.
Promote the geoscientific and mineral endowment aspects of Tasmania at various shows, industry conferences, press conferences, open days and other events.	Successful and timely presentation of promotional material at appropriate venues.	Direct promotional visits were made to companies in Canada. PDAC conference attended in Canada and <i>Mining 2001</i> conference attended in Melbourne. Promotional display was held at the International Giant Ore Deposits Symposium in Hobart.
Prioritise and organise rehabilitation works on abandoned mining lands in compliance with the operation of the Abandoned Mining Lands Rehabilitation Trust Fund.	One major program to be completed each year.	Programs at former tin mines in the northeast and at Storys Creek continued, and rehabilitation of a coal mine at Merrywood commenced.
Monitor environmental performance on exploration and mining tenements.	Field inspections as required.	Regular field inspections conducted. Compliance auditing system developed.
Digital geoscientific coverage of Tasmania's geohazards.	Completion of one map per year.	Six maps of landslide advisory zones in the Tamar Valley produced and advisory maps for the Launceston Urban Mapping Project updated.
Digital geoscientific coverage of Tasmania's groundwater resources.	Completion of one map per year.	<i>Groundwater Prospectivity Map of Tasmania</i> revised and map of the Great Forester River catchment area produced.

Achievement against external targets

<i>Target</i>	<i>2001/2002 result</i>	<i>2000/2001</i>
Increase exploration expenditure and maintain level at 2% of total Australian exploration expenditure.	Exploration expenditure declined to only \$4.0 million in 2001/2002, with Tasmania's share of Australian expenditure declining to 0.63%	1.26%
Increase level of exploration expenditure to a minimum of \$30 million per financial year.		\$9.1 million
Obtain an increase in the area held under Exploration Licence.	Area held under All Minerals and Non-metallic Exploration Licences increased to 8905 km ² . A further 30 356 km ² is held for onshore oil exploration.	8794 km ²
Obtain an increase in the number of Exploration Licences granted.	The number of Exploration Licences held increased to 120.	101
Obtain an increase in the metres of exploration drilling completed.	Exploration drilling decreased by 26% to 31 442 m. This was due to a decrease of on-lease drilling from 31 629 m to 21 201 m. The level of activity outside of Mine Leases was maintained at over 10 000 m, down only 4% from last year, and steady at about 50% of the long term (10 year) average.	42 329 m
Obtain an increase in the percentage of Strategic Prospectivity Zones (SPZ) held under EL's.	The percentage of land in SPZ areas held under EL's increased to 6387 km ² .	4528 km ²

There has been a steady decline in the proportion of national expenditure spent in Tasmania since the last national expenditure peak in 1996/1997. This is probably because:

- copper and zinc, the cornerstones of the Tasmanian industry, have been disproportionately affected by the slump in commodity prices;
- exploration expenditure has been severely impacted by the corporate failures of some companies mining in Tasmania, notably Pasminco and the Beaconsfield Mine Joint Venture partners;
- a trend for major companies to be targeting ever larger ore bodies. This places Tasmania, which is perceived by most companies to be less prospective for giant deposits than other States, in a less preferred position;
- amalgamations and takeovers among the medium to large mining companies, together with downsizing of exploration divisions and increased global competition, have decreased the number of exploration projects being undertaken; and
- Tasmania may be less attractive to junior companies as it is perceived as being remote at a time when venture capital in the mineral exploration sector is difficult to raise.

Mineral Resources Tasmania — Legislation and Committees

Legislation administered

- ❑ Mineral Resources Development Act 1995
- ❑ Mining (Strategic Prospectivity Zones) Act 1993
- ❑ Petroleum (Submerged Lands) Act 1982
- ❑ Iron Ore (Savage River) Deed of Variation Act 1990

Statutory bodies

- ❑ Nomenclature Board

Non-statutory bodies

- ❑ Ministerial Council for Mineral and Petroleum Resources (MCMPR) and associated Task Forces and Working Groups
- ❑ CODES-SRC Advisory Board
- ❑ Evaluation of Geoscience Australia's Geoscience Survey and Research Activities
- ❑ Land Information Coordination Committee (LICC)
- ❑ LICC Sub-committee — The List Management Advisory Group
- ❑ RFA Implementation Group
- ❑ Project TIGER Steering Committee
- ❑ Australian Society of Exploration Geophysicists Data Standards Committee
- ❑ Mineral Resources Industry Advisory Panel
- ❑ ABS Mining Statistics User Advisory Group
- ❑ Tasmanian Statistical Advisory Committee
- ❑ National Groundwater Committee
- ❑ DPIWE Application Assessment Panel
- ❑ Australian Urban Regional Information Systems Association (AURISA)
- ❑ Mining Heritage Committee
- ❑ Mineral Exploration Working Group
- ❑ Gas Approvals Working Group
- ❑ Project Managers and IT Managers Forum

Mineral Resources Tasmania — Branch Activities, 2001/2002

During 2001/2002 Mineral Resources Tasmania consisted of five branches: Metallic Minerals and Geochemical Services; Industrial Minerals and Land Management; Information Systems and Geophysics; Data Management; and Royalty, Finance and Administration.

Because of the integrated nature of the branches, outputs provided under the banner of the Tasmanian Geological Survey are contributed to by staff of most, if not all, branches.

Metallic Minerals and Geochemistry

During 2001/2002 the Metallic Minerals and Geochemical Services Branch was involved in a number of projects and programs.

Western Tasmanian Regional Minerals Program

Planning of projects was undertaken in conjunction with Commonwealth Government, industry, MRT personnel and a consultant. After some delays, multispectral infra-red and side-scan radar data were received from the United States Government agency NASA.

Contractors and MRT staff conducted field checking of features in the aeromagnetic and radiometric data in northwestern and western Tasmania.

A specific study was commenced to recompile and synthesise the geology of Tasmania's main mineralised rock suite, the Mount Read Volcanics (MRV), using WTRMP data and recent exploration company and university research to upgrade the high quality maps produced during MRT's MRV Project conducted in the late 1980s. Fieldwork following examination of the radiometric data resulted in a major revision of the geology of the Mt Jukes–Mt Darwin area and recognition of a significant exploration opportunity in the region.

A large part of Branch time was spent preparing images of WTRMP data for use by geological and geophysical contractors and MRT staff, and in discussions and planning sessions with contractors.

Geoscientific data generation

Compilation of new primary geoscientific data was completed for the Beaconsfield, Port Sorell, West Frankford and Greens Beach 1:25 000 scale map tiles in the form needed for digital capture.

Fifteen geological map sheets (Cameron, Mella, Togari, D'Aguilar, Pearse, Luina, Smithton, Lileah, Endeavour, Hibbs, Birchs, Mainwaring, Veridian, Veridian South and Montgomery) were prepared for digital capture.

Compilation of primary geoscientific data for the Temma and Balfour 1:25 000 scale map tiles in the form needed for digital capture continued. The WTRMP data is providing very useful information on the extent and spatial orientation of geological units and structures.

Samples were collected and submitted for age dating by Geoscience Australia under the National Geoscience Accord TASMAR Project.

Reports on the geology of the Maydena–Skeleton–Nevada–Weld–Picton and the Roger–Sumac–Dempster areas were compiled during the year. A report on the mineralisation of the Balfour area was compiled.

A paper on the geochemistry of Tasmanian granites was completed for the forthcoming TASGO-TASMAR Project volume and progress was made on reports on the late Mesozoic and Cainozoic igneous rocks for the new Geology of Tasmania volume and on the geology of the Wilmot–Cethana area.

A paper on the geology of the Beaconsfield–Port Sorell area was prepared for outside publication and a paper on the controls of gold mineralisation in the Lefroy area was published in the *Australian Journal of Earth Sciences*.

Geologists were trained by an officer of Fractal Graphics on the technique of worming the WTRMP geophysical data, a method that reveals details of major geological structures. The worm interpretations were submitted to the Data Management Branch for digital capture.

A bulletin on the structural control of gold mineralisation in Northeast Tasmania was compiled and submitted to the Publications Section.

Work continued on the AMIRA-SPIRT isotope geochemistry project with companies and CODES-SRC to investigate new mineral exploration techniques relevant to the Mount Read Volcanics. An MRT staff member was working on a sub-project covering the Chester mine area, west of Tullah.

Reports on mineralisation associated with ultramafic rocks and heavy mineral beach sands were progressed.

Database development

The seamless 1:250 000 scale geological coverage of Tasmania was completed and a seamless 1:25 000 scale legend was compiled, with a start made on the seamless 1:25 000 scale geological coverage.

Members of the Branch contributed to the testing of the Web Tenement Information System, Map Viewer Web Content Management System and Spatial Editing System modules for Project TIGER, and a start was made on the development of the geoscience data model.

The remaining stream sediment geochemical data from western Tasmania were captured.

The compilation of metadata on MRT databases was completed and entries made to the Australian Spatial Data Dictionary web pages.

The work of maintaining and upgrading MRT's databases continued through the year, with particular effort being placed on the TASROCK rock catalogue, and the DORIS drill hole, MIRLOCH mineral deposit and ROCKCHEM geochemical databases. Some databases were migrated to the Oracle platform.

A Branch member attended a meeting of government geoscience agencies on database development.

Promotion of Tasmania's exploration potential

The *Mining 2001* conference was attended in Melbourne in November. The Tasmanian display received favourable comment. Geophysical data from the Western Tasmanian Regional Minerals Program (WTRMP) were provided to twelve companies and consultants on CD-ROM and other information on Tasmania was also supplied. An exploration licence application was a direct result of MRT's participation.

A successful one-day workshop on the WTRMP data was held in November at MRT, with twenty industry and university and twelve MRT geoscientists participating.

The Prospectors and Developers Association of Canada annual meeting was attended in late February and early March and a display promoting Tasmania was attended as part of an Australian display. Ten mining and two investment companies were visited in Toronto and Vancouver with the Australian delegation, and a breakfast was held for mining company and financial executives in Vancouver. A luncheon and interview was held with the editor of the *Northern Miner*, Canada's leading industry publication, at the Australian consulate in Toronto. This resulted in the editor interviewing the manager of Allegiance Mining

NL, the company exploring the Avebury nickel deposit near Zeehan, and an article on the deposit being published.

A poster display was presented at the CODES *Giant Ore Deposits Workshop* at Wrest Point in June with considerable support from the Information Systems and Geophysics and Data Management branches. The workshop and display were both very successful, with 165 delegates attending, many from overseas. There was a high level of interest in Tasmanian opportunities.

A paper was prepared on the exploration attraction of Tasmania and was delivered by the Government Leader in the Legislative Council at the Australian Nickel Conference in Perth in October.

Articles and information on mineral prospectivity and exploration activities in Tasmania were prepared for various specialist mining journals.

Core library

Large volumes of core continue to be sent by companies to the Mornington core library. The new storage facility is now 95% full, with more core than can be accommodated stored on pallets. There is space for more core on pallets in the old storage area, but forward planning will be needed in the coming year for an additional extension to enable an orderly expansion of the facility.

The core library expansion project was finalised with the completion of the core inspection facility. Due to the need for more office accommodation at Rosny Park for Workplace Standards Tasmania (WST), MRT's lapidary laboratory was moved to the Mornington complex. As part of the work, funded by WST, the core library supervisor's office and crib room were moved into the main core library area. This move improves the efficiency of operation of the complex with minimal loss of storage capacity.

During the year a Commonwealth Rehabilitation Service trainee worked in the complex for three months. This was highly successful, with the trainee assisting in core storage while gaining fork-lift operator certification. MRT will provide work for another trainee when the opportunity is again available. The field assistant also gained certification to operate the fork-lift truck, so that service can be provided to clients when the supervisor is on leave.

The core library supervisor visited the West Coast to inspect core that will be transferred to MRT in the future. Some of the core had been stored in the open when MRT had insufficient space to accept it and about a third of this has now deteriorated to the point where its transfer is impracticable.

Eighty-three visits were made during the year to inspect drill core, an increase of 167% on visits made in 2000/2001.

Petrological and lapidary laboratories

The lapidary and petrology laboratories provided a total of \$43,588 worth of analyses and services to the Department of Infrastructure, Energy and Resources (\$14,940) and external clients (\$28,648). Most of this external work cannot otherwise be conducted within Tasmania.

The lapidary laboratories prepared 316 standard thin sections and 99 polished thin sections, making a total throughput of 415 samples. This work was valued at \$10,280.

The technical officer for petrological services processed 498 samples by X-ray diffraction, including 173 quantitative dust analyses. He also conducted 165 soil and sizing tests and 63 optical asbestos identifications, a total of 725 samples processed, valued at \$33,308. About half of his time was spent preparing samples for, and operating, the XRF for the geochemistry section.

External (contract) samples received have increased significantly, with 643 being received for investigation, mostly by X-ray diffraction. These samples include 333

for occupational health clients, 217 soils, 34 construction materials, 21 forensic samples and 31 other samples (mostly rocks). This external work came from a wide range of external sources, including Tasmania Police, Department of Public Prosecutions and other government departments, the University of Tasmania (staff and students), various mining, mineral processing and mineral exploration companies, environmental and occupational health consultants, the general public and miscellaneous businesses.

Samples studied included geological materials (construction materials, mineral concentrates, ore samples, rocks, soil, sand, and clay) and anthropogenic materials (including forensic samples, concrete, asbestos sheeting, industrial materials, dust, etc.). Forensic studies continued with work for the Police, DPP, Workplace Standards Tasmania, Tasmania Fire Service and Electrical Safety.

A new digital microscope camera has been procured and installed, enabling rapid production of high quality photomicrography images.

The petrologist has been designated as official radiation safety officer.

Some construction material studies continued as a part of the Tasmanian alkali-aggregate reactivity research project (TAARRP), in conjunction with the Transport Division and Crushed Stone Association. Previous work, produced as consultant reports, is being compiled and prepared for publication as a Departmental report. This project is investigating the concrete and aggregate used in major structures (bridges, dams, etc.) in Tasmania, in regard to the form of deterioration known as alkali-aggregate reactivity.

Curatorial work has included the updating of rock collection and storage databases, sorting and compiling thin sections, cataloguing various rocks, preparation of displays and supervision of the rock store. Some samples were dispatched to other museums on request. The computer database is being updated for later integration with TIGER and TASROCK. Displays in the Rosny complex were reorganised and prepared for Earth Science week.

A geology/mineralogy talk was given, on request, at a local school.

Assistance was given to the West Coast Pioneers Memorial Museum (Zeehan) and the Tasmanian Museum and Art Gallery on storage and movement of mineral specimens, entailing a trip to Zeehan and production of a report.

The storage of some radioactive uranium-bearing samples was investigated and satisfactorily resolved, with the assistance of the Health Physics Division of the Department of Health and Community Services.

The petrologist is helping update the Tasmanian gemstone booklet and the list of designated fossicking areas in Tasmania. This entailed some site visits and a day trip to Launceston to explain fossicking/prospecting regulations to the Tasmanian Lapidary and Minerals Association. The catalogue of mineral occurrences in Tasmania continues to be updated, and this is now substantially complete.

The petrologist also handled numerous public and commercial enquiries on all manner of mineral, mining and rock-related matters, particularly in regard to mineral locations and identification, occupational health issues, and mine locations.

Geochemical laboratory

During 2001/2002 the laboratory was staffed by a senior chemist and a technical officer. A geologist/geochemist and another technical officer provided part time assistance.

The laboratory generates the chemical/geochemical data necessary to maintain MRT's databases. A total of 734 samples, consisting of 501 water samples, 221 rocks and 12 minerals or products, were submitted for 16,495 individual determinations during the year. This compares with 292 samples and 5,882 individual determinations in the previous year. A total of 633 samples were assayed

for 13,701 individual determinations. This compares with 565 samples and 13,004 individual determinations in the previous year. The 633 samples analysed comprised 323 waters, 283 rocks and 27 minerals or products.

Careful operation and maintenance has kept the XRF unit operating in a stable condition throughout the year. New software was installed which is Windows-based and the generated data will be in Excel format. Apart from saving time on the operation of the unit and data processing, this will further limit the possibility of data transposition errors. Excel format for the XRF, Laboratory Register of Chemical Analyses, and water data processing should mesh easily with any TIGER requirements.

A further improvement to the sample preparation laboratory was the acquisition of a rotating sample divider (RSD). The RSD complements the Boyd crusher by allowing 'one step' crushing and splitting of crushed samples. This allows productivity to be maximised. Consideration is being given to improving the dust extraction unit to better match re-vamped emission codes.

On-going activities

Mineral exploration report and exploration performance assessments were carried out as needed, as was preparation of promotional leaflets for Exploration Tender Areas. Particular attention was placed on monitoring performance on exploration licences.

Numerous meetings were held with industry and CODES-SRC, and presentations were given to the Tasmanian Minerals Council Exploration Group on the Western Tasmanian Regional Minerals Program.

Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.

The Branch contributed to the preparation of the *Mineral Resources Development Amendment Bill 2001* and associated documentation. The Bill was passed by both Houses of Parliament.

Comments were received on the Discussion Paper on amending the *Mining (Strategic Prospectivity Zones) Act 1993* and draft legislation was prepared.

Meetings of the Tasmanian Statistical Advisory Committee and the RFA Implementation Group were attended during the year.

Branch staff had training on project management and negotiation skills during the year and some did a refresher first aid course.

A Branch member attended the International Convention on Remote Sensing in Sydney in July.

Industrial Minerals and Land Management

This branch is mainly responsible for the investigation and promotion of industrial minerals, including coal and hydrocarbons, the management of mineral tenements, land access issues and environmental control of exploration activity, and the protection of mining heritage. It is also responsible for the management of groundwater resources, waste management, and geohazards, especially land stability.

Petroleum exploration

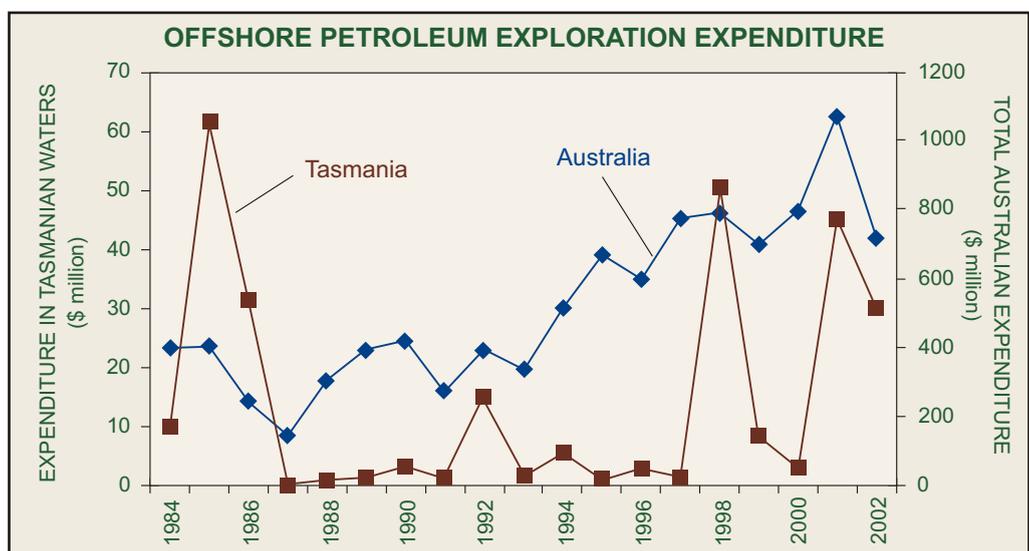
Two offshore permits and one onshore permit are currently held for oil and gas exploration, and there is a retention lease over the Yolla gas/condensate field in the Bass Basin. No hydrocarbons are produced in Tasmania or offshore waters, but gas production from the Yolla and Thylacine fields is expected to commence in the near future.

The retention lease over the Yolla field is held by a consortium headed by Origin Energy Resources Ltd and AWE Petroleum Ltd. In October 2001, the consortium was granted a renewal of the retention lease, with the expectation that a Production Licence application would be made in 2002. The BassGas project to develop the Yolla field involves construction of an undersea pipeline to a processing plant onshore Victoria. The project is expected to supply around 10 per cent of Victoria's natural gas needs for fifteen years, with completion and first production due in the third quarter of 2004. MRT has been involved with discussions with the BassGas proponents, and Victorian and Commonwealth government agencies, regarding the necessary approvals for the project.

The Thylacine gas field was discovered in permit T/30P in the Otway Basin, northwest of King Island, in May 2001. A successful appraisal well was drilled in September–October 2001. Woodside Energy Ltd, the operator of the permit, has commenced feasibility studies into development of the Thylacine field.

Fugro Multi Client Services undertook a further non-exclusive seismic survey in the Otway Basin in November 2001. This activity comprised the second phase of a major regional survey of prospective basins offshore of western Tasmania. This latest phase provides a modern, high-quality seismic coverage of two currently available offshore exploration areas that lie close to the recent Thylacine discovery.

Collaborative studies of the Bass and Sorell basins by MRT, Geoscience Australia and the National Centre for Petroleum Geology and Geophysics (NCPGG), funded by the Western Tasmanian Regional Minerals Program, continued through 2001/2002. These studies, which include seismic reprocessing, are leading to a greatly improved understanding of the petroleum prospectivity of these basins. Results are due to be released in late 2002.



In June 2002, MRT agreed to fund further studies on aspects of the petroleum prospectivity of the Sorell Basin by the NCPGG, to be completed by April 2003.

Three areas covering the northern part of the Sorell Basin, offshore western Tasmania, were gazetted for competitive work program bidding in 2001. Bids for two of these areas were received by the closing date in April 2002. The remaining area has been re-released, with a closing date of 25 October 2002. Four areas, two in the Otway Basin and two in the Bass Basin, were gazetted in April 2002 and are currently available for bidding, with bids closing on 10 April 2003. MRT staff have been actively involved in promotion of the offshore release areas, most importantly at major industry conferences.

Onshore, Great South Land Minerals Ltd holds Special Exploration Licence 13/98 for petroleum, covering most of the Tasmania Basin. Stratigraphic drilling resumed at Hunterston in the Central Plateau in June 2002. Further seismic acquisition is planned in southern and central Tasmania in 2002/2003.

Tasmanian Gas Pipeline

In December 2001, Duke Energy International began construction of the \$380 million, undersea Tasmanian Gas Pipeline (TGP) linking Tasmania with the Australian mainland, and bringing natural gas to Tasmania for the first time. The majority of pipe-laying activities were complete by August 2002. MRT has been closely involved with approvals for this project under the *Environmental Management and Pollution Control Act 1994*, the *Commonwealth Petroleum (Submerged Lands) Act 1967* and the *State Petroleum (Submerged Lands) Act 1982*.

The TGP will transport natural gas from Longford in Victoria to Bell Bay, Hobart and Port Latta via approximately 740 km of onshore and offshore pipeline. The gas will be sourced from the Gippsland Basin in Bass Strait and made available, via the TGP, to industrial and domestic markets in Tasmania.

The TGP project will have significant positive direct and indirect economic and employment benefits. There will also be environmental benefits by substituting natural gas for the more polluting fuels such as coal, oil and domestic firewood. The project is consistent with the national objective of encouraging competition in the energy market.

Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km² or 37% of Tasmania. The areas in each SPZ occupied by mining tenements at the end of June 2002 are shown below.

SPZ	Metallic		Non-metallic	
	Area (km ²)	Occupied (%)	Area (km ²)	Occupied (%)
Adamsfield	68.4	92.8	0.0	0.0
Arthur	131.43	11.87	22.0	2.0
Balfour	1038.4	26.5	450.3	11.5
Beaconsfield	19.0	99.9	4.0	21.0
Cape Sorell	427.0	30.9	0.0	0.0
Mount Read	1899.0	26.41	227.8	3.2
North East	1259.3	12.4	274.7	2.8
Zeehan/Waratah	565.5	30.8	0.0	0.0

It is encouraging to note that compared to last year's occupancy figures for metallic minerals, the Mount Read SPZ has increased from 15.1% to 26.41%, the North East SPZ from 7% to 12.4%, and the Zeehan/Waratah SPZ from 16% to 30.8%. The other areas have remained relatively static.



Industrial minerals

Tasmania Magnesite NL (previously Crest Magnesium NL) intends to sell the magnesite retention licences at the Arthur and Lyons rivers in northwest Tasmania and is actively seeking a buyer.

Mineral Holdings Australia Ltd continues to seek a joint venture partner for the northwest dolomite and limestone areas and intends to develop an export industry based on chemical, industrial and agricultural carbonate products.

The proposal to develop heavy minerals beach sands at Naracoopa on King Island by Tasmanian Titanium Pty Ltd has received all necessary approvals from the King Island Council and the Tasmanian Government. It is still the company's intention to proceed with the mine when outstanding legal issues are settled and funding is secured.

J. J. MacDonald Pty Ltd has continued to investigate the Maydena/Pine Hill silica flour deposit. The work in the past year has moved from defining the *in situ* resource to testing the chemical and physical properties of the deposit.

Environmental management

The environmental monitoring of exploration programs continued with diligence and attention to detail. Regular field visits were made to ensure exploration work was being conducted in an environmentally responsible manner and that rehabilitation of past sites was successful.

Compliance auditing

In response to the Regional Forest Agreement and the RPDC CAR Inquiry, Mineral Resources Tasmania instigated a GIS-based project in 1998/1999 to develop a recording system of on-ground exploration activity. This project would allow compliance auditing of the *Mineral Exploration Code of Practice* and, in the longer term, outcome-based auditing of the environmental effects of exploration in Tasmania.

Twenty-six work programs were submitted to MRT for approval during the past year, with twenty-four work programs being approved and two pending. Ten of these programs were in CAR Reserves and required comment from the Mineral Exploration Working Group.

The table below summarises the types of activities within a broad division of Tasmania's land tenure system.

<i>Activity</i>	<i>Car Reserve System</i>	<i>High Quality Wilderness</i>	<i>State Forest</i>	<i>Crown Land</i>	<i>Private Property</i>	<i>HEC Land</i>
Drill Sites	9	0	11	4	5	1
Tracks (m)	750	0	520	50	50	50
Costeans	0	0	0	0	1	0
Helipads	0	0	0	0	0	1
Bulk Samples	0	0	0	0	3	0

A total of 9.875 hectares of on-ground disturbance was reported through the year. The distribution of this disturbance between land tenures and activity types is shown below:

<i>Activity</i>	<i>Car Reserve System</i>	<i>High Quality Wilderness</i>	<i>State Forest</i>	<i>Crown Land</i>	<i>Private Property</i>	<i>HEC Land</i>
Drill Sites	0.45	0	0.55	0.20	0.25	0.05
Tracks	3.75	0	2.6	0.25	0	0.25
Costeans	0	0	0	0	1	0
Helipads	0	0	0	0	0	0.225
Bulk Samples	0	0	0	0	0.3	0
Total (ha)	4.2	0	3.15	0.45	1.55	0.525

Of the 9.875 ha of disturbance, 4.525 ha was rehabilitated during the year. The remainder will be rehabilitated over a period of time, depending on the future work at the particular prospect and the planning strategy of the explorer.

The following table shows the rehabilitation figure in terms of the particular activity that has been rehabilitated in relation to the land tenure categories. A percentage of the area rehabilitated against the disturbances is also shown. Overall, 45.8% of the total area disturbed in the reporting period, for all land categories, has been rehabilitated.

<i>Activity</i>	<i>Car Reserve System</i>	<i>High Quality Wilderness</i>	<i>State Forest</i>	<i>Crown Land</i>	<i>Private Property</i>	<i>HEC Land</i>
Drill Sites	0.30	0	0.25	0.15	0.25	0.05
Tracks	1.75	0	0	0	0	0.25
Costeans	0	0	0	0	1	0
Helipads	0	0	0	0	0	0.225
Bulk Samples	0	0	0	0	0.3	0
Total (ha)	2.05	0	0.25	0.15	1.55	0.525
Percentage of overall disturbance rehabilitated	48	100	8	33	100	100

Because of the very low impact of gridding this activity does not feature in terms of disturbance attributed to exploration activity, although it does constitute a portion of the proposals and as such is still noted. A total of 78.2 line kilometres of gridding was undertaken in the year, with 35.55 km in CAR Reserve System areas, 32.45 km in State Forest, 3 km on Crown Land and 7.2 km on HEC land.

It is a licence condition that all disturbances will be rehabilitated on expiry of the licence and prior to the return of the environmental bond.

Codes of Practice

The fourth edition of the *Mineral Exploration Code of Practice* is a code under the *Mineral Resources Development Act 1995*.

The second edition of the *Quarry Code of Practice* was issued in September 2000 and has been gazetted as a code under the *Mineral Resources Development Act 1995*.

Mining operations

Several mining operations experienced financial difficulties during the year. These included ABM Savage River, Beaconsfield, CMT Mt Lyell, Pasminco Rosebery and Renison Bell. Most operations still managed to carry out development activities which are briefly outlined below.

Development of the southern deposit at ABM Savage River, which is located three kilometres south of the mine infrastructure, followed the installation of a new crusher. Waste from this development is being used to rehabilitate 'B' dump from the older operation. An upstream lift of the Main Creek tailings dam was also completed.

At the Beaconsfield gold mine concentrator performance and gold production was improved to meet budget requirements. Decline development and pump station development continued. A drilling program confirmed a five-year probable ore reserve to provide security for future operations.

Operations at the Blackwood No. 3 colliery of Cornwall Coal NL neared completion following exhaustion of coal reserves. Production from the Duncan mine at Fingal will be increased to make up the shortfall. The Huntsman open cut was worked out and rehabilitation is being planned. A trial washing of coal from the Cullenswood open cut bulk sample was successful and continued development is planned to meet future production requirements.

Ventilation shaft and underground development was carried out for the Mt Julia resource at AurionGold's operation at Henty. The Newton tailings dam is being raised in preparation for increased concentrator throughput.

Investigations were carried out by MRT, the Department of Primary Industries, Water and Environment, and Pasminco Rosebery Mine to evaluate environmental liabilities at the company's Hercules mine. There were concerns that the financial difficulties facing the group may have forced the sale of the company's Tasmanian operations, however this was averted. The Rosebery mine carried out decline development from surface to improve future access to underground operations.

Zeehan Zinc commenced rehabilitation of a waste dump at their Comstock mine near Zeehan. A concentrator was constructed and planning carried out for a tailings dam.

Tasmanian Acid Drainage Reconnaissance

A Natural Heritage Trust-funded statewide reconnaissance study of acid drainage from abandoned mines, and of the occurrence of acid sulphate soils, was completed after two years work. Four maps, two reports and two posters were produced to assist in dissemination of the information. A public seminar was held at Smithton to publicise acid sulphate soil risk posed by current agricultural practices in the area.

Rehabilitation

Rehabilitation works were carried out by MRT at the following abandoned mines:

- alluvial tin mines in the northeast near Gladstone;
- Merrywood open-cut coal mine;
- Storys Creek tin and tungsten mine;
- gravel pits at Beaconsfield;
- shaft protection and weed control programs at Zeehan;
- Bangor slate mine; and
- gorse control at the Queensberry mine.

Work was funded by the Rehabilitation of Abandoned Mining Lands Trust Fund. A detailed report is provided later in this Review.

Mine rehabilitation

Australian Paper continues revegetation work at the former Tonganah clay mine, following the closure of the operation in 1999. Progress is satisfactory and relinquishment of a section of the lease has been approved.

Mt Lyell remediation program

Investigations concerning the feasibility of extracting copper from emissions from the Mt Lyell lease continued. The most promising process considered was solvent extraction and electro-winning (SXEW), together with partial neutralisation of run off from the mine. The Department of Primary Industries, Water and Environment carried out the work using Commonwealth funds from RiverWorks Tasmania and the Natural Heritage Trust. The \$12.2 million cost for a plant, with annual operating costs greater than \$1 million, were higher than originally anticipated and far higher than the available funding of \$7 million. A public information program was carried out to publicise the findings.

Savage River rehabilitation program

The major work undertaken was the rehabilitation of 'B' dump in conjunction with ABM's stripping operation for the southern deposit. Work was also carried out on Hairpin Dump and in the crusher gully. The strategic plan was reviewed and endorsed by the Board of Environmental Management. An independent review supported the program and established the major environmental risks to the program as follows:

- synergies exist between mine operations and rehabilitation works and cost benefits accrue by co-ordinating rehabilitation and operations, hence premature closure of the mine is a threat to successful completion of the program;
- seepage from the No. 1 Main Tailings Dam has the potential to acidify the Main Creek tailings dam; and
- emissions from other older dumps pose a lesser threat.

Planning issues

An information program is under development to provide geological information for town planners. A series of maps is being produced showing areas of prospective mineral and construction material resources, which are considered important for future access and use by the community. Maps to provide information on groundwater prospectivity and land stability are also being developed.

The Resource Planning and Development Commission are developing a Planning Scheme Template to bring some conformity into planning schemes across Tasmania. A submission was made to ensure adequate protection is provided to mineral, construction materials and groundwater resources.

Mineral, construction material and groundwater resource information was provided for the West Tamar and Break O'Day planning schemes.

Tailing dams

An amendment to the *Water Management Act 1999* is under consideration and recommendations to improve the safety of tailing dams have been drafted in consultation with industry groups, including the Tasmanian Minerals Council.

Lease Inspection System

An integrated lease management system has been developed that utilises GPS instruments and GIS packages (ArcView and ArcGIS). The result is a lease management system that provides accurate surveys of quarries, sand pits and small mining sites. Survey information can be downloaded in electronic format for further analysis and presentation in MRT's existing Geographic Information System. For larger sites, and sites that have formal survey information, the position of

boundaries and faces can be imported into the GIS. Digital images, and historic charts and other hard copy formats, can be scanned, geo-referenced and utilised in lease management.

The system has greatly improved MRT's knowledge of the location and layout of small quarrying operations and the extent, type and progress of mined land rehabilitation. The new system has greatly enhanced the quality of information that MRT is able to supply to clients, other government agencies and intra-agency information users. The lease management system will become a part of the TIGER corporate databases once preliminary development and trials are complete.

Mining heritage surveys

MRT has undertaken three mining heritage archaeological surveys during the year;

- Moina water race reserve;
- Melaleuca tin mining sites associated with the late Denny King (major report);
- Evandale tunnel (at the request of the Evandale Historical Society).

Preliminary work has been undertaken to develop a simple mining heritage data and information management system. This system will emphasise the spatial location and description of mining heritage sites that are encountered during inspection visits and during focussed surveys. The underlying philosophy of the system will be that it will be quick and efficient to use and that it will follow the standard GPS survey and data-gathering system being developed for mine lease management. An existing custom designed Access database will be utilised to record historical and archaeological information about mine sites.

Project TIGER

Branch members have contributed to the following aspects of the development of Project TIGER during the past year;

- ongoing refinement of REGIS to meet the needs of the Tenement Management Section;
- membership of the working group looking at the Internet Tenement Information System;
- assistance in the further development of areas of TASXPLORE;
- definition of functional requirements and business rules for the new MRT groundwater and geohazards systems; and
- review of the National Groundwater Data Exchange Standard.

Time was also spent examining the rationale and process of the Tasmanian Exploration Auditing and Monitoring System (TEAMS) project. The project was originally developed outside of the TIGER framework and it is essential that TEAMS now be incorporated within the scope of TIGER. A working party has been established to manage this function and one aim is to expand the project to be an integrated system applicable not only to exploration activities, but also to mining issues and the functions of the lease inspectorate.

The construction materials database (CONMAT), originally compiled in the early 1980s, has been brought up to date, in preparation for its integration into an Oracle database. CONMAT is a register of approximately 3000 existing and historical sources of construction materials such as gravel, sand, clay and building stone.

Registry Section

The Registry Section maintains a number of mining tenement registers in hard copy and electronic format. The section provides advice to officers within Mineral Resources Tasmania, inquirers from other agencies, the mining industry, the legal profession and the general public on a wide range of matters associated with mining tenements and legislation.

The processing of applications for mining tenements and issue of tenement documentation continues to provide the majority of work for the section's officers.

Close liaison is maintained with professional geological officers of Mineral Resources Tasmania, particularly in relation to maintenance of the TASXPLORE database, monitoring of exploration expenditure, circulation of company reports, and preparation and circulation of the *TasXplorer* news sheet.

The section liaises with a number of other agencies in regard to tenement applications and provides information to field staff who monitor on-ground activity on mining tenements.

Requesting and collation of production and expenditure statistics is an important activity carried out by the section. These statistics provide the basic data for collection of royalties and assessment of exploration levels.

Twenty-seven exploration tender areas were offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated widely within the Australian mining community. The news sheet is sent to 343 clients of Mineral Resources Tasmania by facsimile (94), email (63) and post (180), and is also available on the MRT web site.

Officers of the section play a key role in maintenance of the TASXPLORE and REGIS modules within the TIGER database management system.

Mining Legislation

The *Mineral Resources Development Act 1995*, which came into force on 1 July 1996, is the principal legislation relating to the management and regulation of mining tenements in Tasmania.

During the year the Act was amended to remove some anomalies and to ensure that the royalty provisions in the Act and the *Mineral Resources Regulations 1996* reflected agreements reached by government and the mining industry.

Landslip provisions under the *Local Government (Building and Miscellaneous Provisions) Act 1993* are to be brought under the geoscientific investigation and research sections of the *Mineral Resources Development Act 1995*. The office of the Parliamentary Counsel has undertaken drafting of an appropriate Bill.

Mineral Resources Tasmania provides information through *Service Tasmania* outlets and forms approved under the *Mineral Resources Development Act 1995* are available via MRT's web page or on disc.

Mining Tribunal

Under the *Mineral Resources Development Act 1995* a Mining Tribunal, consisting of a magistrate, has coverage of all Tasmania.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before there is a formal hearing before the Tribunal. In effect this usually consists of an informal meeting, arranged by the Registrar of Mines, between the parties.

Experience to date suggests that the dispute resolution process required by the Act adequately covers most situations that would otherwise require formal determination. To date there have been no matters that have proceeded to formal hearing before the Mining Tribunal, although the Tribunal has formally ratified agreements reached during dispute resolution.

Tribunal matters dealt with by Mineral Resources Tasmania, or referred to the Mining Tribunal during the year, were:

74049 North Forest Products v Tasmania Mines Ltd

Claim for unpaid royalty arising from mining on land owned by applicant. Meeting convened by Registrar of Mines unable to resolve matter. Hearing date set and adjourned by Mining Tribunal to allow exchange of documents. Unresolved to date.

74100 J H Lawrence and others v Sorell Council — MLA 1718P/M

Objection lodged by adjoining landowner affected by proposed buffer zone around a quarry application. Meeting convened by Registrar of Mines. Land owner has agreed in principle to course of action. Mining Tribunal has instructed Registrar to issue lease containing agreed conditions.

74110 J Wrigley v Mercator Metals Pty Ltd — ELA 18/2000

Objection lodged by holder of mineral water licence. Registrar unable to resolve matter. Referred to Mining Tribunal for determination.

74111 P C Sims v Goldfields Exploration Pty Ltd — ELA 8/2001

Objection lodged to highlight natural values of areas within application area. Agreement reached at meeting convened by Registrar. Formal withdrawal received.

74134 P C Sims v Tasex Resources Ltd — ELA 24/2001

Objection lodged to highlight natural values of areas within application area. Agreement reached at meeting convened by Registrar. Formal withdrawal received.

74129 P C Sims and Tasmanian Conservation Trust v Greenstone Resources NL — ELA 17/2001

Objection lodged to highlight natural values of areas within application area. Agreement reached at meeting convened by Registrar. Formal withdrawal received.

74138 Waratah–Wynyard Council v Minister — 31M/1976

Appeal against Minister’s refusal to approve application for renewal of lease. Appeal withdrawn.

74139 M Kroll and Mineral Holdings Australia Pty Ltd v A R Nicholas — ELA 27/2001

Objections lodged by adjoining landowner and overlapping exploration licence holder. Agreement reached at meetings convened by Registrar. Formal withdrawals received.

74142 Thweng Pty Ltd v RNB Trading Pty Ltd — ELA 29/2001

Objection lodged by landowner. No resolution to date.

74145 E A Cameron v Australian Sandstone (Tas) Pty Ltd — ELA 31/2002

Objection lodged by landowner. No resolution to date.

74146 Various objectors v Mineral Holdings Australia Pty Ltd — ELA 33/2001

Objections lodged by a number of residents of St Helens to protect heritage values of the Blue Tier area. Registrar has conducted a mediation meeting. Matter has been referred to the Mining Tribunal. Informal discussions between the parties are continuing.

74148 Estate of C J G Cox and L L Cox v Sapphire Trading Limited — ELA 35/2001

Objection lodged by landowner. Meeting convened by Registrar. No resolution to date.

74151 Estate of C J G Cox and L L Cox v Sapphire Trading Limited — ELA 2/2002

Objection lodged by landowner. Meeting convened by Registrar. No resolution to date.

74152 K Petersen v Waratah–Wynyard Council — 31M/1976

Claim for damages arising out of mining operations on land adjoining the claimant’s property. Referred to Mining Tribunal for determination.

74153 P C Sims and Tasmanian Conservation Trust v New Challenge Resources Pty Ltd — ELA 4/2002

Objection lodged to highlight natural values of areas within application area. Agreement reached at meeting convened by Registrar. Formal withdrawal received.

*74155 P C Sims and Tasmanian Conservation Trust v Ausvaal Projects Pty Ltd
— ELA 8/2002*

Objection lodged to highlight natural values of areas within application area. Objection withdrawn after consideration of site-specific conditions prepared by Registrar.

74157 P Sims v Adamus Resources Ltd — ELA 18/2002

Objection lodged to highlight natural values of areas within application area. No resolution to date.

Lease applications, 2001/2002

Total number of all types of exploration rights held as at 30 June 2002

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Exploration Licences —		
All minerals	107	7 921 km ²
Non-metallic minerals	12	984 km ²
Oil (onshore)	1	30 356 km ²
Retention Licences —		
All minerals	16	83 km ²
Non-metallic minerals	14	205 km ²
Prospectors Licences Issued	98	Not applicable
Permits to explore for Petroleum under <i>Petroleum (Submerged Lands) Act 1967</i>	3	210 Blocks
Retention Licence under <i>Petroleum (Submerged Lands) Act 1967</i>	1	9 Blocks

Leases applied for

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	2	41
Clay	1	1
Gold	1	510
Gravel	1	4
Limestone	1	25
Sand	3	310
Sand and gravel	2	124
Sandstone	1	7
Specimens	7	44
Stone	7	38
Stone and gravel	5	138
Total	31	1242

Leases granted

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	1	7
All minerals and stone	1	4945
Clay	1	3
Gravel	8	75
Sand	2	107
Sand and gravel	1	16
Specimens	2	6
Stone	2	20
Stone and gravel	3	35
Total	20	5214

Mineral Resources Tasmania

Total number of leases in force at 30 June 2002

<i>Principal product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	31	18 609
All minerals and stone	5	5 115
Clay	9	94
Coal	4	6 339
Coal and stone	1	175
Copper	1	5
Dolerite	1	40
Dolomite	2	138
Easements	21	311
Gold	17	1 538
Granite	4	50
Gravel	168	3 086
Gravel and clay	1	29
Kaolin	1	184
Lime sand	4	219
Limestone	11	1 301
Magnesite	3	520
Magnetite	1	55
Ochre	1	15
Peat	4	858
Quartzite	1	191
Sand	45	2 173
Sand and gravel	25	1 378
Sand and stone	9	298
Sandstone	5	55
Shale	3	35
Silica	4	436
Silica, sand and stone	1	50
Silica sand	1	20
Slate	3	165
Specimens	18	119
Stone	235	5 489
Stone and gravel	19	452
Tin	9	1 074
Umber	1	6
Total	665	50 622

Engineering Geology and Groundwater Section

This section provides geoscientific information for the management of groundwater resources, waste disposal sites, and geohazards, especially land stability. By ensuring relevant geoscientific data are available to the public and private sectors, better land-use decisions can be made.

The section was involved in a number of projects and programs during the year. Enquiries from local government, other agencies and the general public for information on both engineering geology and groundwater continued as a prime function.

Engineering geology

During the year land stability issues continued to receive attention and work to revise and integrate various previous mapping methodologies was carried out. Dr Fred Baynes, a national expert in the field of landslide assessment, was engaged to develop a strategy based on modern concepts and techniques for future landslide assessment by MRT. The associated software for land hazard and risk assessment (LHARA) was developed as a GIS extension. A trial study of the strategy was carried out in northern Tasmania, with MRT staff receiving brief training on the methodology used during a field visit to the study area. A short training course was organised for future MRT users of the LHARA software.

The process of declaration of a landslip area, under the *Local Government (Building and Miscellaneous Provisions) Act 1993*, was finalised for Legana (West Tamar) and Casuarina Crescent (Glenorchy). A report for the proclamation of the recent landslide at Lowana, near Strahan, was received from Pitt and Sherry consulting engineers. Regular monitoring of groundwater levels in boreholes at the site of the Rosetta landslide continued. Advice on stability issues relating to the Rosetta and Casuarina Crescent landslides was provided at regular meetings with the Glenorchy City Council.

Pitt and Sherry were engaged to conduct a review of eight landslides that have the potential to threaten property and infrastructure in northern Tasmania. A contract surveyor continued regular monitoring of these landslides in accordance with the recommendations from the Pitt and Sherry report.

Two reports, describing work completed on an area at Tarooma that has been subject to land instability for several decades, were published during the year. MRT's study aimed to enlarge the existing monitoring network, re-establish the regular monitoring, investigate the potential failure mechanism and determine the extent of the landslide affected area. Coffey Geosciences Pty Ltd subsequently produced a report on landslide risk assessment and management in the Tarooma area.

Information was provided to the public, other agencies and companies on land stability issues concerning a wide variety of locations throughout Tasmania.

Groundwater

The program of compiling groundwater maps, using data held by MRT, continued during the year. These maps will provide the information necessary for the management of water resources by the Department of Primary Industries, Water and Environment (DPIWE). Map boundaries for this program are delineated by surface water catchments defined by DPIWE. A draft map of the Great Forester catchment was finalised, with work starting on the Meander catchment map.

Work on the 1:500 000 scale Tasmanian groundwater flow map was completed in collaboration with DPIWE. This map was compiled using existing 1:250 000 scale geological maps of Tasmania and hydrogeological information held in the MRT groundwater database. An accompanying report is being prepared. The map and report will represent a basis for the future management of the dryland salinity processes in Tasmania.

Work has commenced on data entry and data verification for the BORIS groundwater database and is expected to last throughout the next year. During the year the data was migrated to the Oracle database. As an integral part of the TIGER project, BORIS is currently undergoing a major redesign, which will enable easier data collection and sharing with other users.

The program of monitoring groundwater quality and selective water tables across Tasmania continued on a six-monthly basis. Initial work was completed on the compiling of data logger information relating to changes of groundwater levels in the monitoring bores. A review of this network is underway to identify maintenance requirements, gaps in the coverage, and data storage and retrieval methods.

General information on groundwater resources, pollution and quality was provided to other agencies, companies and members of the public. A decrease was noted in the number of groundwater-related telephone enquires in the period following the spring season of 2001, possibly related to the marked increase in rainfall in many areas. Consultants investigating pollution problems at a number of sites in Tasmania were supplied with information relating to groundwater.

Groundwater quality protection issues with respect to a number of wastewater reuse schemes continued to form an important element of the section's activities. The section provided valuable input into the State Committee on Wastewater Reuse, providing advice on the potential effects on groundwater of this method of irrigation, which is rapidly gaining popularity. The section also provides advice on groundwater issues relating to mining tenements.

A project to examine soil salinisation in Tasmania, which forms part of a major joint project with DPIWE, continued during the year. The project involves the investigation and modelling of groundwater and groundwater chemistry at three case study sites (Waterhouse, Tunbridge and Coal River) and is being undertaken as a consultancy. Funding for the project was provided by the Natural Heritage Trust. It is expected that future salinity investigations undertaken in Tasmania, as part of the National Action Plan for Salinity, will continue to refine the models developed as part of this NHT project.

A Natural Heritage Trust-funded project investigated groundwater quality at various waste disposal sites across Tasmania. The project was completed in April 2002 and was undertaken in conjunction with local government and the Department of Primary Industries, Water and Environment. The final report contains recommendations on geotechnical issues that should assist operators in the management of waste disposal sites in the future.

1:25 000 scale digital geological map program

The Richmond and Taroona 1:25 000 scale geological maps were published in 2002, and represent (together with the Hobart map published in 2000) a significant upgrade of the geological coverage in the greater Hobart area.

Compilation of the Tea Tree, Broadmarsh, Elderslie, Bains, Dilston and Launceston geological maps was completed after limited fieldwork to upgrade the coverage. Compilation of the Colebrook, Kempton, Stonor, Bothwell, Dennistoun and Oatlands sheets is underway, and work has begun on the Vincent, Tunbridge and Ellinthorp map sheets. Mapping was also undertaken in the Granton area and at Paradise Gorge, near Orford, at the request of the Roads Division.

Information Systems and Geophysics

The main activities of the Information Systems and Geophysics Branch during the year were:

- continuation of the development of the MRT information management system by Project TIGER (Tasmanian Information on Geoscience and Exploration Resources);
- implementation of the recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program (WTRMP); and
- rationalisation of MRT's information technology infrastructure.

The branch also provided geophysical services and advice to MRT and our clients, and computer and network support for MRT.

The branch is structured to reflect the functions needed to achieve the required outcomes and has Project, Operations and Geophysics sections. At 30 June there were two permanent staff members and two fixed-term staff members in the Project Section undertaking activities related to Project TIGER, and three permanent systems support staff in the Operations Section. The Branch Manager is also responsible for geophysical activities.

Major branch achievements during the year included:

- introduction of digital reporting requirements for exploration activities;
- release of an Internet Tenement Information System to provide client access to open-file tenement-related information held by MRT;
- map or text-based searching available on the MRT website;
- implementation of a facilitated cultural change process for MRT;
- migration of the MRT website to Oracle Portal;
- release of aeromagnetic, radiometric and digital terrain data acquired over King Island, west and northwest Tasmania as part of the WTRMP;
- release of a qualitative interpretation of the WTRMP aeromagnetic and radiometric data;
- completion of acquisition of helicopter-borne frequency domain electromagnetic data over the Mt Read Volcanics, areas of shallow granite, and the Balfour area as part of the WTRMP; and
- scanned exploration reports made available for viewing and downloading via the Internet.

Data capture

Capture of metadata summarising technical documents relating to exploration continued throughout the year, with 117 new summaries entered and 275 summaries updated. In addition to Internet searching of the summaries of open file technical documents held by MRT, many of the documents relating to onshore exploration can be viewed or downloaded in full over the Internet.

The introduction of digital reporting has the potential to provide information in a form that allows ready conversion to formats for Internet viewing and downloading. Consultation with stakeholders to ensure closer compliance with the data formats detailed in national guidelines, and development of appropriate business processes within MRT over the next year, will reduce the time from receipt of digital reports to completion of conversion.

Project TIGER

A review of the project's resource requirements and business plan was completed and the Project TIGER Steering Committee endorsed the resumption of system development as part of Project TIGER Phase 4. A temporary Project Officer position was held by Tony New from September 2001 until March 2002 and by Louise Archer from June 2002. Elli Tsaloukis was appointed as a temporary Senior

Systems Analyst in January 2002. A register of contractors with expertise relevant to developments being undertaken by Project TIGER was established after evaluation of responses to a public call for expressions of interest.

An Internet Tenement Information System has been released and provides client access to open-file tenement-related information held by MRT. There are options for text or map-based searching of tenement details and searching of summaries of associated technical documents. This searching facility is a valuable research tool for a range of MRT clients ranging from local historians to global mining and exploration companies. A development to allow on-line tenement applications is currently under way and will allow applications for mineral exploration tenements in Tasmania to be lodged from anywhere in the world.

The geoscience data model is central to the integration of MRT's corporate information into a single information management system. Scoping of the geoscience data-modelling task has been completed, including analysis of data flows and business processes. Working groups have been established to provide information on existing systems, issues to be resolved, and to define the functions of the new system. A tender brief has been developed, and tenders called, to allow progressive delivery of the data model allowing consequent application development and data migration to begin as early as possible.

Relevant training of MRT staff has been recognised as a key outcome of Project TIGER. All MRT staff are participating in a facilitated cultural change process which has been accompanied by an emphasis on cross-branch projects and communication within MRT and also with MRT clients. Project planning and management training has been provided at a Divisional level and targeted training has been delivered in more technical areas, including ArcGIS, Java and Object Oriented programming.

IT summary

In accordance with government guidelines, MRT replaces desktop PCs every three years and transfers the original PCs to the Schools Program. New PCs are purchased with the current Microsoft enterprise operating system and as a consequence Windows 2000 is being progressively introduced as new PCs are installed. An additional high performance A0 plotter has been purchased to replace a unit for which the manufacturer could no longer provide maintenance support.

There are four network PC servers, three of which run Windows NT. The main PC network server is running Netware 5.1 and offers approximately 72 gigabytes of on-line storage. Windows NT servers provide anti-virus, e-mail, Intranet and image delivery services to MRT staff. Files on the corporate Unix systems are also accessed from PCs using Samba software. Automatic gathering of software inventories from desktop PCs and licence metering are part of the IT infrastructure. Updating, to give higher performance and greater storage capacity, and some rationalisation of these servers is planned for the coming year.

Last year's reduction in the number of Unix servers has proven to be an effective use of resources whilst continuing to offer a high level of service to users. A further consolidation will be made in the coming year. There are now three Unix systems used to provide corporate information technology services to MRT staff. In addition there is a Unix server dedicated to development and testing for Project Tiger, predominantly for Oracle applications, and a small Unix server used for interim storage and backup of documents scanned under the WTRMP. Another two Unix servers external to the Rosny Park building host the MRT website. Use of the Ingres database ceased early in 2002.

The operational group has engaged in a number of research and development projects during the year to support other Divisional activities, including application development under Project TIGER and document scanning under the WTRMP. A number of databases have been migrated from Microsoft Access or Fortran to

Oracle as a stable interim platform before integration into the MRT corporate information management system. A number of options for storage of the digital versions of the scanned documents were reviewed and tested before a suitable network-attached storage unit was selected for this purpose. The most suitable migration paths from ArcView3.2 to ArcGIS and from Office97 to Office2000 were selected after evaluation of a number of options. Existing internal MRT applications accessing the corporate information management system were enhanced in response to user requests.

The MRT website has been migrated to the Oracle Portal product and includes both document and map viewers. The new website was launched at the end of February 2002 and is a high-speed access point for clients using the open-file data held in the MRT corporate information management system. Open-file data, with the exception of the documents scanned under the WTRMP, are replicated on a daily basis from the MRT corporate information management system to the website. The extremely large volumes of data associated with the scanned documents have prevented routine replication, and research into possible options for replication is continuing. Monitoring and feedback tools have been developed for the website.

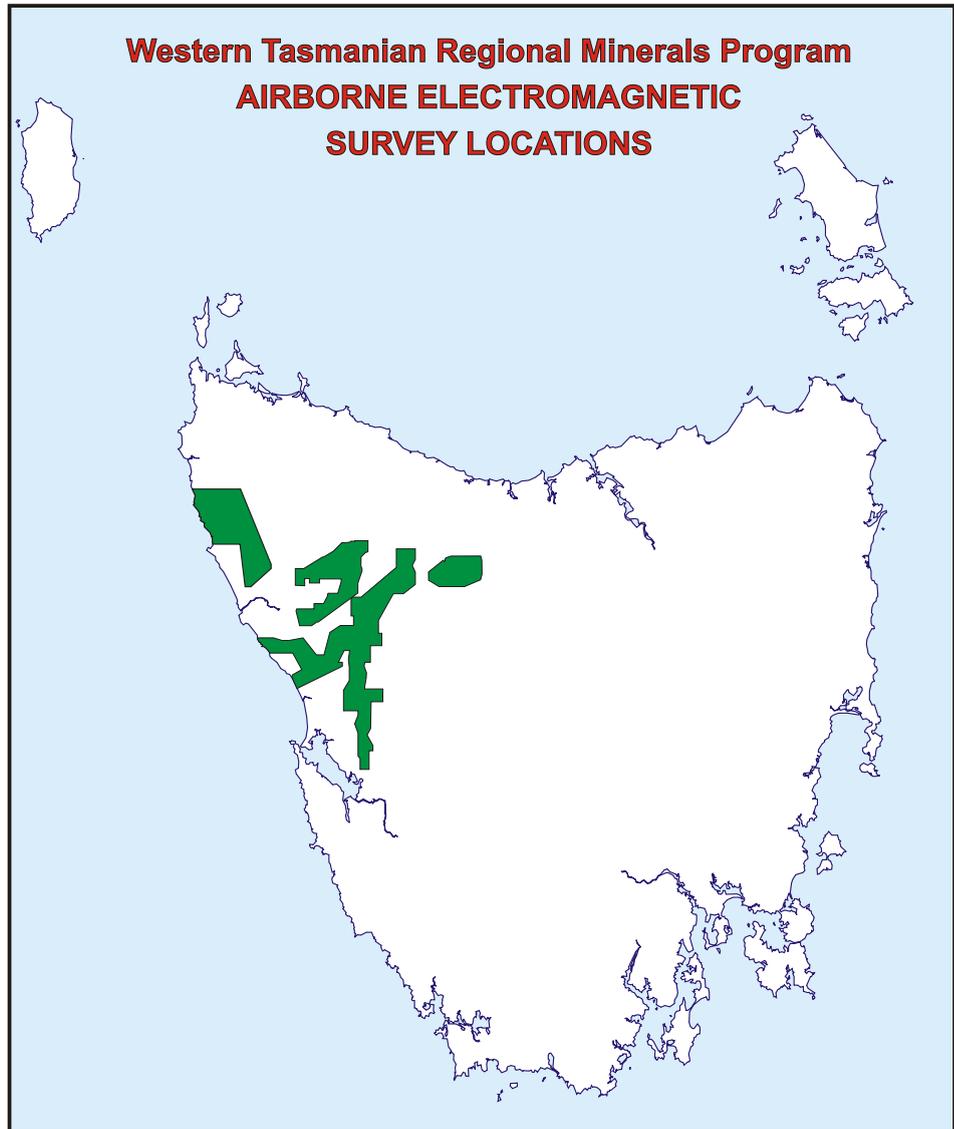
Western Tasmanian Regional Minerals Program

A Reference Group, with an independent chairman and members drawn from the Tasmanian Minerals Council, the Department of Industry, Science and Resources and MRT, developed a series of projects to implement the geoscience infrastructure recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program. The Information Systems and Geophysics Branch is responsible for the acquisition of aeromagnetic, radiometric and airborne electromagnetic data over parts of King Island and western and northwestern Tasmania, and for the scanning and implementation of Internet viewing and downloading of the technical documents held by MRT.

Data from approximately 114 180 line kilometres of aeromagnetic data acquired over King Island and western and northwestern Tasmania were released in October 2001 and have been well received by the mineral exploration industry. Two additional batches of CDs were produced in response to the demand. To increase the value of these data, particularly to groups not familiar with Tasmanian geology, a contractor was commissioned to work in consultation with MRT staff to produce a qualitative interpretation of the data. A preliminary version of the interpretation was released in February 2002 for display and distribution at the annual meeting of the Prospectors and Developers Association of Canada, with the final version being released in May 2002. The data represent the first consistent coverage of the areas flown and allowed quantitative interpretation of a number of key areas to be undertaken by contractors in consultation with MRT staff. A report presenting the results of the quantitative interpretation will be released in the first half of 2002/2003.

Helicopter-based acquisition of frequency domain electromagnetic data over the Mt Read Volcanics, selected areas where the interpreted depth to granite is less than four kilometres, and over the Balfour area commenced in February 2001. Equipment difficulties required the survey to be suspended after approximately 1000 line kilometres. Acquisition resumed in October 2001 and was completed in April 2002. Initial quality control images show that the data are of high quality. The data will be released at the end of August 2002. A co-operative project has been established with the School of Earth Sciences at the University of Tasmania to carry out additional work on the electromagnetic data and two Honours students have worked on the data acquired.

Digitisation of exploration-related data continued, with mineral deposit data for the entire WTRMP area, except for parts of the Dundas and Beaconsfield 1:25 000 scale map sheets, being checked for location and primary reference source.



Rock-chip geochemistry has been captured from company reports submitted between 1994 and 2000. Scanning of TASXPLORE documents is largely complete and scanning of PETXPLORE documents has commenced. The quality of information received from the scanning contractor has improved over the duration of the project, with a consequent decrease in the number of re-scans. Viewing and download facilities for the scanned documents have been developed for the Intranet and Internet and were launched at the end of February 2002. The contracts of the scanning team were completed effective 28 June 2002 and the project will be paused until new staff are engaged early in 2002/2003.

Geophysics

Digital reporting of exploration activities in Tasmania became compulsory in November 2001. MRT, in conjunction with other jurisdictions within Australia, has adopted a common set of standards for the digital lodgement of exploration reports. Individual explorers are being advised on the best way to comply with these standards. GGIPAC will be releasing a new version of the software application for producing standard headers to accompany digital data lodgements in 2002/2003 and there will be further information programs for explorers before the use of standard headers is phased in.

The new Commonwealth Spatial Data Pricing Policy, introduced in February 2002, will allow MRT to provide a more complete service to clients in the longer term. Once the conditions of use and re-distribution of Commonwealth data are fully specified a new set of image, hardcopy and digital products will be released.

Data Management

The role of the Data Management Branch includes:

- ❑ the recording of mining tenements on the Division's maps and plans;
- ❑ the management of the Division's Geographical Information System and Computer-Aided Drafting system; and
- ❑ the provision of support drafting services.

During 2001/2002 the capture of geological data continued resulting in the completion of:

- ❑ seven 1:25 000 scale digital geological maps in western Tasmania (Hibbs 1, Hibbs 2, Gog, Mella, Cameron, Togari and Pearse);
- ❑ three 1:25 000 scale digital geological maps in northeast Tasmania (Harford, Port Sorell, Greens Beach); and
- ❑ two 1:25 000 scale digital geological maps in southern Tasmania (Taroona and Richmond);

Capture of revised geological data for Beaconsfield was also completed.

Work on the 'seamless' coverage of 1:25 000 scale digital geology of Tasmania continues, with maintenance being carried out on a regular basis.

Six detailed digital maps of the landslide advisory zones of the Tamar Valley region were produced. The landslide advisory zone maps of the Launceston Urban Mapping Project were also revised, with seven new digital maps being produced.

The 1:500 000 scale digital *Groundwater Prospectivity Map of Tasmania* was revised. A 1:100 000 scale digital map of the Great Forester River catchment area was produced as part of the Groundwater Prospectivity of River Catchments Project.

A series of maps, designed to provide information to land-use planners in an easily understood format, has been prepared. The information will allow local government and land and infrastructure planners to make informed decisions relating to development, zoning and land-use activities. The maps include information on mineral prospectivity, location of mines and quarries, location of current exploration licences and mining leases, construction material locations and land stability. Information on groundwater prospectivity is also being gathered. Forty-nine maps, in three themes, covering Tasmania, have been produced at a scale of 1:100 000.

A tenement information system is now available on the MRT website and digital tenement data is available as a free download. Eighty-one datasets of digital geological data were produced for clients.

CAD continues to be used as a support tool for many projects, with 84 maps and plans and 177 tenement maps and diagrams being produced throughout the year.

Output maps of digital geological data were produced on demand using the Agency's inkjet plotters.

Publications

The Publications Section is responsible for the production of geological reports, promotional books, newsletters and material for displays, Exploration Tender Area flyers, maintenance of content on the Mineral Resources Tasmania Internet site, and other reports and leaflets as required. Major publications produced during the year included:

- ❑ the Mineral Resources Tasmania *Annual Review*;
- ❑ *Mineral Exploration Opportunities in Tasmania — A summary of opportunities for mineral exploration and mineral resource development in Tasmania — February 2002*.

Reports issued in the *Tasmanian Geological Survey Record* series included:

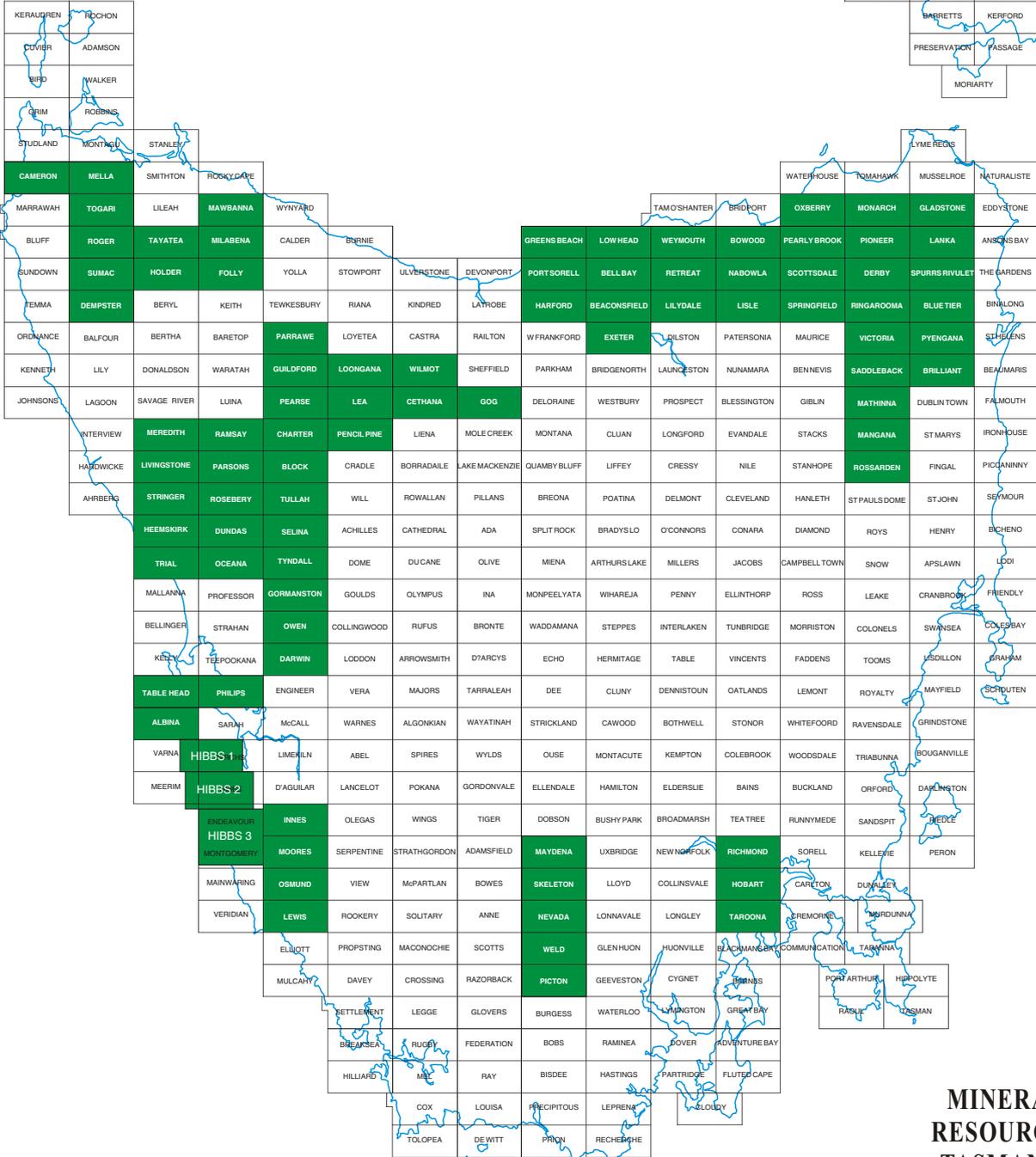
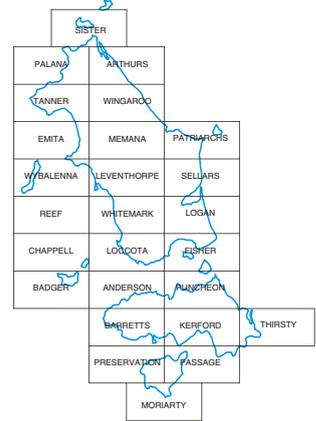
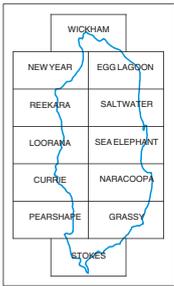
1994/19 — *A field guide to gold deposits in northeastern Tasmania*, J. Taheri and R. Keele.

1995/14 — *A geophysical interpretation of the Oatlands area*, by R. G. Richardson.

1:25 000 SCALE

DIGITAL GEOLOGICAL MAP PROGRAM

As at 30 June 2002



Map complete



- 2001/01 — *An investigation of land stability in the Taroona area*, by M. Latinovic, A. Waite, C. R. Calver and S. M. Forsyth.
- 2001/05 — *Tasmanian Acid Drainage Reconnaissance. 1: Acid drainage from abandoned mines in Tasmania*, by S. Gurung.
- 2001/06 — *Tasmanian Acid Drainage Reconnaissance. 2: Distribution of acid sulphate soils in Tasmania*, by S. Gurung.
- 2001/07 — *Rare earth, tantalum and niobium minerals reported in Tasmania*, by R. S. Bottrill.
- 2001/08 — *A mineralogical field guide for a Western Tasmania minerals and museums tour*, by R. S. Bottrill.
- 2001/10 — *Investigation drilling at Taroona*, by A. Waite
- 2001/11 — *Drilling at Casuarina Crescent, Berriedale*, by A. Waite
- 2001/12 — *A review of groundwater monitoring at Rosetta (1991–2001)*, by A. Waite
- 2001/13 — *Glaucofane and phengite-bearing amphibolite, Port Sorell: Mineral composition and petrology*, by R. S. Bottrill.
- 2002/02 — *Monitoring bore holes at the Rosetta landslip and recommendations for bore hole maintenance repairs*, by A. R. Ezzy.

Library

The library continues to be staffed by a full-time librarian, with assistance being provided two days per week. The Workplace Standards Tasmania collection, although co-located in the Rosny Park library, is maintained separately. A permanent part-time librarian was appointed to manage the Workplace Standards Tasmania collection in September 1999.

Technical Services

The Inmagic DB/Textworks library management software was updated during the year to version 5.01. A second copy of DB/Textworks was purchased and installed for use on a cataloguing project.

A part-time library technician began work on the cataloguing project in October. This involved the transfer of the books card catalogue entries onto the Inmagic library management software. The majority of uncatalogued books in stack were also catalogued onto Inmagic through the combined efforts of the librarian and library technician.

Cataloguing of new books and journals onto Inmagic DB/Textworks continued during the year.

Collection

Work has continued on collection maintenance and improved access to information. Considerable time has been spent reorganising the journal collections, housed in both the compactus and the main collection, to maximise available space.

Scanning of company reports, Mineral Resources Tasmania reports and petroleum reports continued. The first batch of these reports became available for viewing or downloading from the MRT website.

Despite an increase in the price of journals, all subscriptions were renewed but limited funds resulted in only seven new books being purchased.

External reports released during 2001/2002

DOMACK, E.; *BACON, C. A. 2002. Tasmanite — a geological enigma. *40° South* 24:32–35.

*REED, A. R. 2002. Structure and setting of Proterozoic and Palaeozoic rocks in the Tamar region, northern Tasmania. *Field Guide Geological Society of Australia Specialist Group in Tectonics and Structural Geology* 9.

*REED, A. R. 2002. Pre-Tabberabberan deformation in eastern Tasmania: a southern extension of the Benambran Orogeny. *Australian Journal of Earth Sciences* 48:785–796.

* MRT author

Mineral Sector Overview

The 2001/2002 year continued the difficult and volatile period for the mining industry, with the prices of base metals remaining low throughout the year, a situation exacerbated in some cases by unfavourable currency hedging arrangements.

Renison Bell Limited curtailed its exploration program. In April, Sirocco Resources NL announced that it would be acquiring the mine from Murchison United NL and later foreshadowed a name change to Renison Consolidated Mines NL.

Pasminco Ltd went into voluntary administration in September and there was some uncertainty about the future of its Tasmanian assets. Despite the company's financial problems, the Rosebery mine continued to perform well and its future was assured with the decision to invest \$10 million in the completion of a decline to enable ore to be hauled directly to the surface by truck.

Ivanhoe Mines announced a loss of US\$66.2 million from the Savage River mine, which included a US\$53.8 million write down of the mine's assets and a foreign exchange loss of US\$7.9 million in a tightening iron ore market.

On a more positive note, the Beaconsfield gold mine continued to operate under an administrator and the performance of the mine improved substantially during the year, with production up 25% on the previous year to 90% of design capacity. Problems with the gold recovery plant were overcome.

AurionGold Limited reported new resource and reserve figures as a result of an ongoing successful exploration program, sufficient to extend the life of the Henty mine for at least another five years.

The Australian Bureau of Statistics (ABS) reported a 60% decrease in Tasmanian mineral exploration expenditure to \$4 million for the year compared with \$9.2 million in 2000/2001. Tasmania's share of Australian expenditure halved from 1.3% to 0.63%. These are the lowest figures in both absolute and proportional terms since statistics have been collected. The Tasmanian Minerals Council convened an exploration crisis meeting in May at which the Deputy Premier promised Tasmanian Government support to stimulate the sector. Part of the downturn can be attributed to the difficulties of a number of companies with operating mines in Tasmania, which have traditionally been at the forefront of exploration activity.

Despite the low expenditure levels, there was significant progress in the nickel exploration being conducted by Allegiance Mining NL on three separate prospects. A new resource figure of 3.05 million tonnes at 1.54% nickel was calculated for the Avebury prospect. Allegiance announced that it had raised \$750,000 and would undertake a 3500 metre drilling program at Avebury. The company also announced further promising intersections in drilling at the Cuni area, east of Zeehan, with a best intersection containing 6.1% nickel, 2.0 % copper, 0.47 grams per tonne platinum, 0.71 grams per tonne palladium and 0.44 grams per tonne gold over a true width of 1.3 metres. Allegiance also completed a series of six shallow diamond-drill holes totalling 130 metres at the newly discovered Burbank prospect east of Trial Harbour. Forty-one samples were assayed for nickel, with most in the range of 1 to 1.5% and extreme values of 0.52 and 1.78%.

There was also evidence that data generated by the Western Tasmanian Regional Minerals Program (WTRMP) was stimulating exploration licence applications, especially in areas where airborne electromagnetic surveys had been flown, despite the data not being due for release until the end of August 2002. This trend, if sustained, should result in a significant boost to exploration activity within two years.

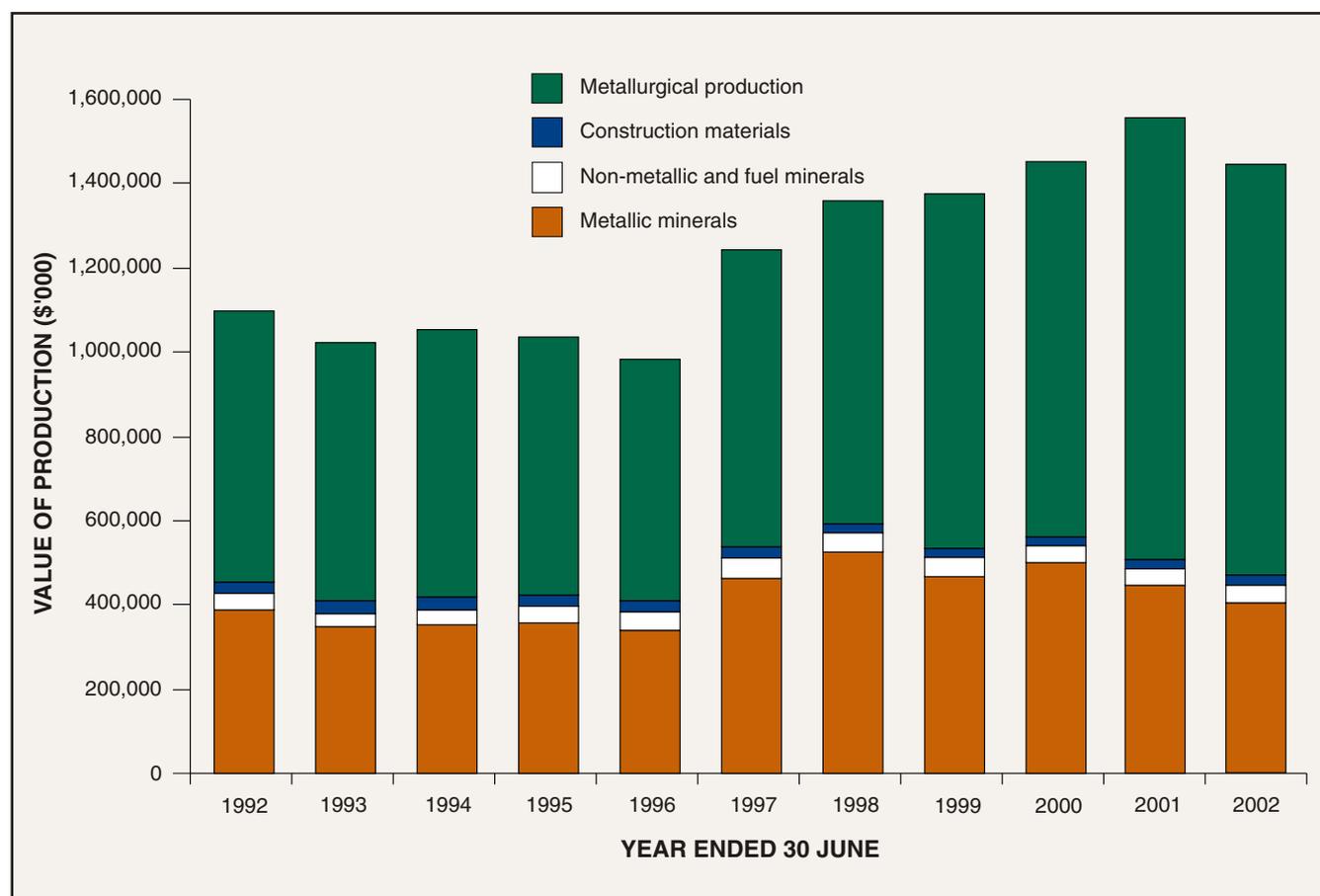
Value of the Tasmanian Mineral Industry

Year ended Commodity	Unit	30 June 2001 Total Quantity	30 June 2002 Total Quantity
Metallic Minerals			
Copper (assayed)	(tonne)	30 127	33 494
Gold (assayed)	(kilogram)	6 549	6 287
Iron ore pellets	(tonne)	2 027 324	2 151 637
Iron (in magnetite)	(tonne)	47 327	57 280
Lead (assayed)	(tonne)	30 290	26 950
Silver (assayed)	(kilogram)	100 544	89 925
Tin	(tonne)	8 985	7 226
Zinc (assayed)	(tonne)	77 430	81 023
<i>Value of Metallic Minerals</i>		\$444 840 694	\$401 498 625
Non-Metallic, Industrial and Fuel Minerals			
Clay –			
Cement	(tonne)	77 687	80 240
Brick	(tonne)	15 078	18 970
Other	(tonne)	0	10 570
Kaolin	(tonne)	5 266	6 593
Dolomite	(tonne)	7 214	5 900
Limestone –			
Agricultural	(tonne)	161 798	135 811
Cement	(tonne)	1 612 923	1 664 805
Chemical and metallurgical	(tonne)	62 096	67 595
Other	(tonne)	56 822	65 971
Silica (glass and other)	(tonne)	163 381	163 287
Sulphuric acid	(mono tonne)	291 199	431 471
Coal (run of mine)	(tonne)	473 097	547 693
Coal (washed)	(tonne)	349 389	387 158
Peat	(m ³)	807	35
<i>Value of Non-Metallic and Fuel Minerals</i>		\$38 908 767	\$43 401 718
Construction Materials			
Building stone –			
Freestone	(tonne)	27	0
Other	(tonne)	4 228	3 466
Sandstone	(tonne)	1 401	878
Crushed and broken stone –			
Basalt	(tonne)	596 775	724 411
Dolerite	(tonne)	742 724	891 422
Limestone	(tonne)	46 369	48 730
Sandstone	(tonne)	496	26
Other	(tonne)	182 231	203 455
Gravel (aggregate)	(tonne)	41 438	25 220
Sand	(tonne)	315 650	363 675
Other road materials	(tonne)	1 528 636	1 483 038
<i>Value of Construction Materials</i>		\$20 438 698	\$24 898 711
Total value with Australian metal prices		\$504 188 159	\$469 799 054
Value added production from Tasmanian and other ores			
Aluminium)			
Cadmium)			
Cement)			
Ferromanganese)		\$1 054 668 594	\$972 740 360
Silicomanganese)			
Sinter)			
Superphosphate)			
Zinc)			
Total value of mining and metallurgical production		\$1 558 856 753	\$1 442 539 414
Reported average number of employees ¹		3522	3452

1. Not all operators report full details

Value of Production, 2000/2001 and 2001/2002

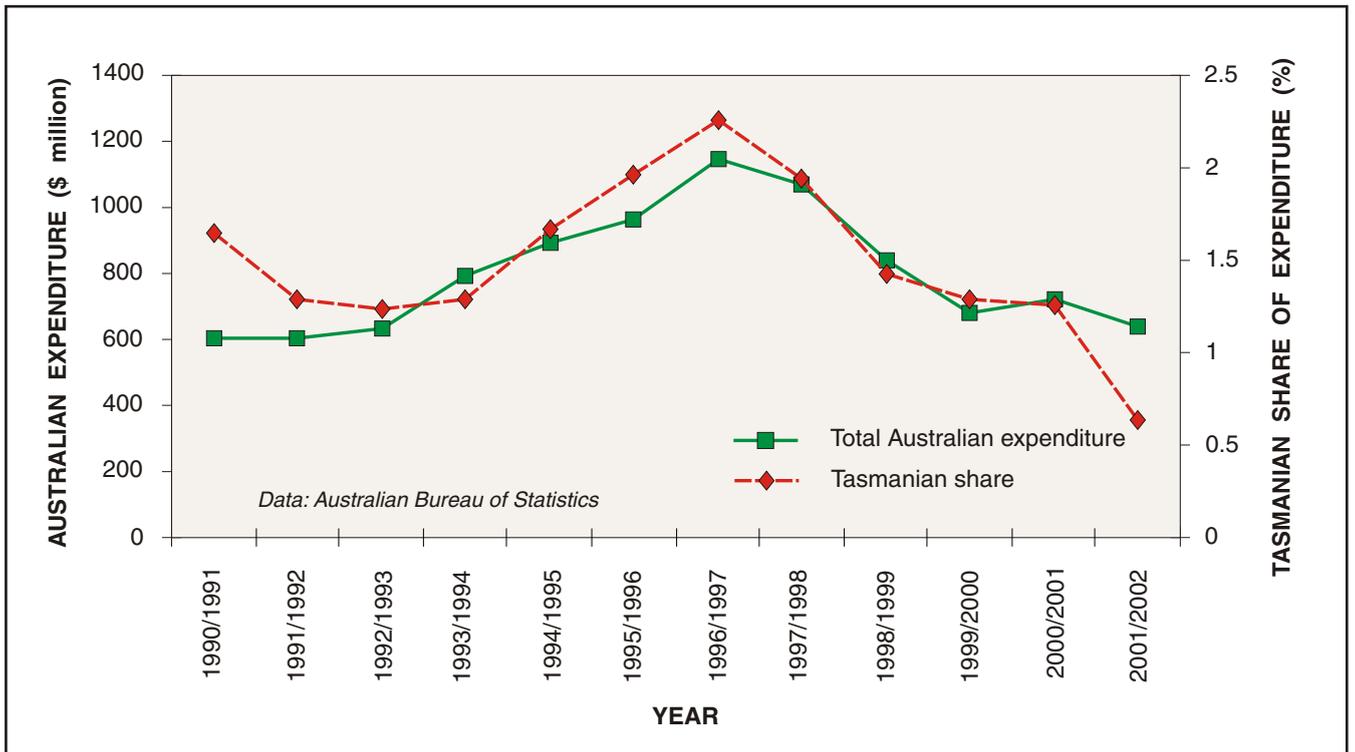
	2000/2001		2001/2002		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Gold	6.55	-	6.29	-	-4.0
Silver	101	-	90	-	-10.9
Zinc	77 430	-	81 023	-	4.6
Copper	30 127	-	33 494	-	11.2
Lead	30 290	-	26 950	-	-11.0
Tin	8985	-	7226	-	-19.6
Iron ore pellets	2 027 324	-	2 151 637	-	6.1
Total metallic minerals	-	444,841	-	401,499	-9.7
Non-metallic and fuel minerals	-	38,909	-	43,402	11.5
Construction materials	-	20,439	-	24,899	21.8
Value added production from Tasmanian and foreign ores	-	1,054,669	-	972,740	-7.7
Value of mining and mineral processing production	-	1,558,857	-	1,442,539	-7.5



Mineral exploration expenditure

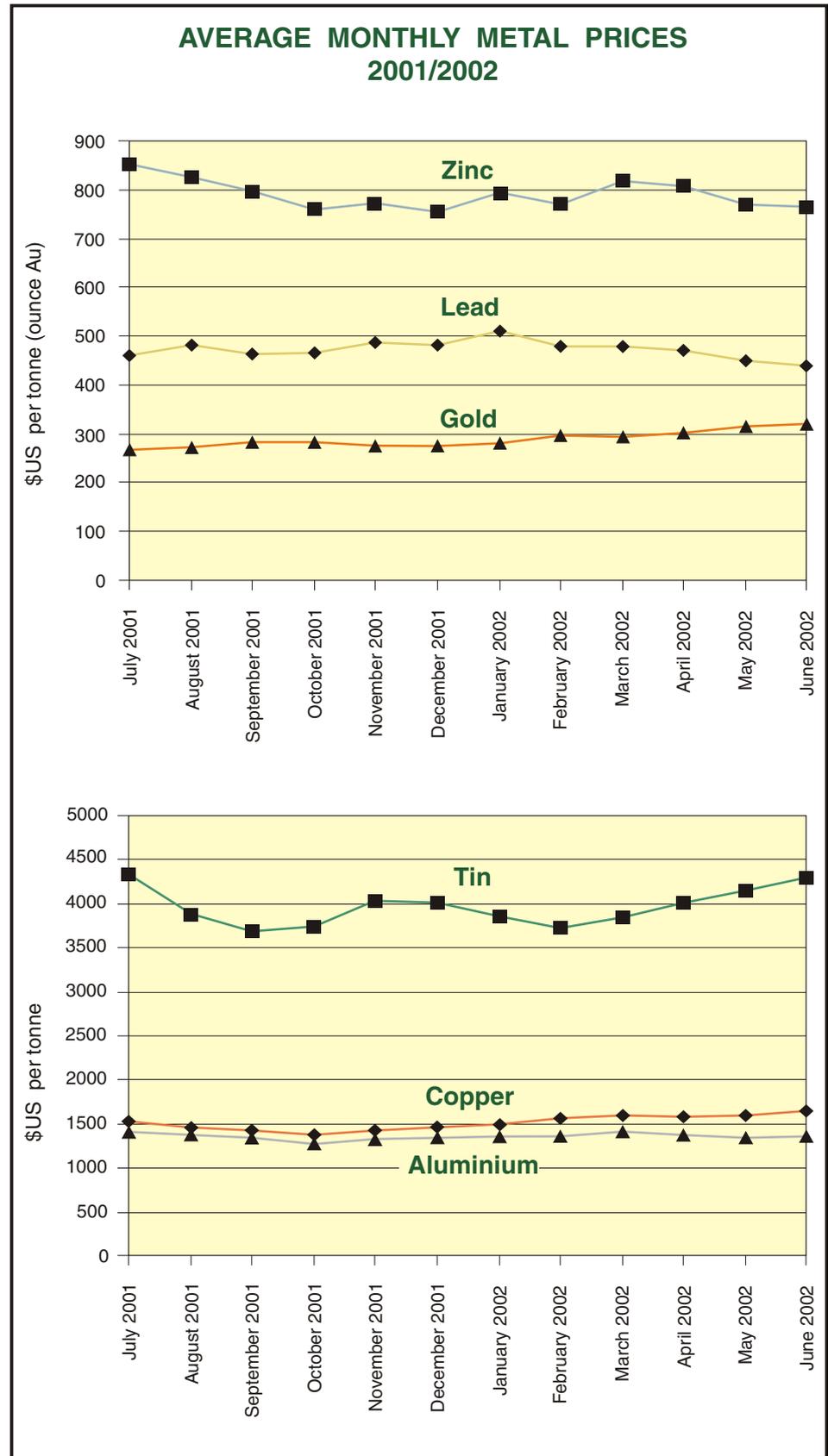
Year	Australian Expenditure (\$ Million)	Tasmanian Expenditure (\$ Million)	Tasmania as % of Australian Expenditure
1990/1991	601.5	9.9	1.65
1991/1992	603.7	7.8	1.29
1992/1993	631.7	7.8	1.23
1993/1994	792.6	10.2	1.29
1994/1995	893.4	14.9	1.67
1995/1996	960.2	18.8	1.96
1996/1997	1148.6	26.0	2.26
1997/1998	1066.8	20.7	1.94
1998/1999	837.8	11.9	1.42
1999/2000	676.4	8.7	1.29
2000/2001	721.3	9.1	1.26
2001/2002	635.7	4.0	0.63

Source: Australian Bureau of Statistics — Actual and Expected Private Mineral Exploration, Australia.



Metal Prices

The Australian Bureau of Agricultural and Resource Economics (ABARE) reported that world prices for most metals fell in 2001/2002 because of substantially weaker global economic growth. Any improvement in metal prices will be dependent on the timing of economic recovery, especially in the United States, and a significant increase in global demand.



Review of Mineral Sector Operations — Metallic Minerals

BASE METALS

Western Metals Limited — Hellyer Operations

Western Metals Ltd continued to operate a metallurgical research and development facility at River Road, Wivenhoe. Seven people were employed full time and one part time. Hellyer Metals Ltd, a fully owned subsidiary of Western Metals Ltd, employed one person full time and three contractors were employed on care and maintenance, security and environmental monitoring duties at the Hellyer mine site.

Hellyer Metals Project

The Hellyer tailings resource contained in a water-covered storage dam comprises 10.88 million tonnes @ 0.16% Cu, 3.0% Pb, 2.8% Zn, 88 g/t Ag, 2.6 g/t Au. The aim of this project is to process Hellyer tails and other smelter waste feedstocks containing zinc and precious metals to produce zinc, copper, gold and silver metals at the Hellyer mine site. The flowsheet under development includes pressure oxidation leaching of tails, atmospheric leaching of smelter waste, zinc liquor iron removal with limestone, zinc liquor purification and electrowinning. Precious metals would be recovered from pressure leach residue by conventional cyanidation.

Progress included laboratory testing of the hydrometallurgical process. Some elements of the process were operated at pilot scale to test performance on a continuous basis.

Western Metals' Technical Services Group also continued to provide support to the Mount Gordon and Lennard Shelf operations, and develop solutions for the future requirements of the company. In particular, significant progress was made in zinc and chalcopyrite pressure leaching.

Pasminco Australia Limited Pasminco Rosebery Mine

Ore production from the Rosebery mine totalled 778 256 tonnes at 11.8% zinc. Lower level K and P lenses were the main sources of production, with 589 117 tonnes @ 12.4% Zn being mined. Production from the upper levels totalled 124 292 tonnes @ 10.3% Zn. The Rosebery Surface Decline Project opened up several previously inaccessible ore zones, with 60 327 tonnes of ore @ 7.6% Zn being mined. Production from the Rosebery open cut totalled 4521 tonnes @ 18.4% Zn.

Development

A total of 4987 metres of development advance was completed. A high proportion of capital development was required to continue extending the K and P declines at depth, in order to access future ore zones. The operating development was predominantly in the two main lower working panels, K Lens and P Lens. Development produced 137 000 tonnes of ore and 256 000 tonnes of waste.

Milling

Mill throughput totalled of 755 629 tonnes assaying 11.45% Zn, 3.88% Pb, 0.29% Cu, 129 g/t silver and 1.8 g/t gold. Production for the year totalled:

- 138 716 tonnes of zinc concentrate at 56.32% Zn;
- 35 644 tonnes of lead concentrate at 67.2% Pb and 1294 g/t silver;
- 5638 tonnes of copper concentrate at 21.97% Cu, 11.6% Pb, 4562 g/t silver and 114.2 g/t gold;
- 374 kg of doré containing 66% gold and 31% silver.

Concentrator tonnage increased 2.8% because of consistent mine output. Zinc circuit quality performance improvement was maintained with output up 7.5% as a result of the mill feed availability, higher feed head grades and improved recovery.

Reserves

The ore reserve inventory at Rosebery as of March 2002 showed an overall decrease of 0.268 million tonnes compared with March 2001. This decrease was due to depletions from mining, revisions of the resource following infill drilling, and the transfer of some remnant resources to the 'inaccessible' category.

Identified ore reserves as at March 2002 comprised:

<i>Category</i>	<i>Tonnes (000s)</i>	<i>Pb (%)</i>	<i>Zn (%)</i>	<i>Cu (%)</i>	<i>Ag (g/t)</i>	<i>Au (g/t)</i>	<i>Fe (%)</i>
Proved	1777	3.5	10.6	0.37	110	1.9	7.8
Probable	549	3.7	13.0	0.66	116	2.0	13.8
Total	2326	3.5	11.2	0.44	111	1.9	9.2

Identified mineral resources as at March 2002 comprised:

		<i>tonnes (000s)</i>	<i>Pb (%)</i>	<i>Zn (%)</i>	<i>Cu (%)</i>	<i>Ag (g/t)</i>	<i>Au (g/t)</i>	<i>Fe (%)</i>
Rosebery	Measured	2 048	4.1	12.2	0.43	125	2.4	8.9
	Indicated	888	4.5	15.5	0.67	150	2.3	15.7
	Inferred	5 804	5.7	17.5	0.37	173	2.3	9.1
	Inaccessible	2 532	3.4	11.6	0.71	108	2.1	14.7
	Meas. + Ind. + Inf.	8 740	5.2	16.1	0.41	159	2.3	9.7
	Total	11 272	4.8	15.1	0.48	148	2.3	10.8
South Hercules	Indicated	520	2.0	3.7	0.11	167	3.0	4.6
	Inferred	40	1.2	3.2	0.10	22	3.3	2.5
	Total	560	1.9	3.7	0.11	157	3.0	4.4
GLOBAL	Meas. + Ind. + Inf.	9 300	5.0	15.4	0.39	159	2.3	9.4

Exploration

An orientation partial leach soil sample line was completed over the Rosebery Lodes prospect and two partial leach soil sample lines were completed north of the Rosebery mine, one to infill a previously defined anomaly. Some whole-rock geochemical sampling was undertaken using existing exploration drill holes to determine vectors to mineralisation. A review of the regolith expression of the Rosebery and Hercules mineralisation was completed.

Drilling

Underground exploration continued through the year. The exploration to date has been successful in defining extensions to K Lens and RS Lens. A total of 31 801 metres of diamond drilling was carried out, 29 661 metres underground and 2140 metres on surface.

Capital expenditure

Approximately \$20 million of capital expenditure was made during the year. The major projects undertaken were:

- Underground development — \$7.6 million (ongoing);
- Exploration drilling (2000/2002) — \$2.3 million (complete);
- Exploration drilling (2001/2002) — \$100,000 (ongoing);
- Surface Decline Stage 1 — \$2.36 million (complete);
- Surface Decline Stage 2 — \$2.96 (ongoing);
- 17 Level Pump Station — \$760,000 (ongoing);
- Simba Replacement — \$1.46 million (complete).

Personnel

A total of 223 people were employed including temporary and casual employees. Nine lost-time accidents were sustained. A total of 104 Process Improvement Opportunity (PIO's) strategies were submitted for the year 2001/02.

Environment

PRM continue to implement ISO14001 Environmental Management System standard with a target for accreditation in December 2002. Pasmenco Limited continue to be a signatory to the *Australian Minerals Industry Code for Environmental Management*. At PRM the implementation of this code is undertaken through the ISO14001 system (i.e. procedures, community consultation and sustainable development reporting).

An estimated 576 506 tonnes of mill tailings were pumped to storage in the Bobadil tailings dam during 2001/2002. A two-metre lift on the northern wall was completed with a final inspection conducted on 13 May 2002.

Approximately 85 000 tonnes of waste rock were brought to surface from the new surface decline and deposited, as part of the site rehabilitation strategy, in worked out areas of the Southern Open Cut. No waste rock was brought to surface as a result of current mining operations.

The EMP Review report detailing environmental management at the mine was submitted in January 2002. The EIP for Hercules expired in April 2002 and discussions are currently in progress with government to establish a new way forward under an Environmental Decommissioning and Rehabilitation Plan.

Planned rehabilitation works continue to be undertaken mainly within the Hercules mine, various minor areas around the site/town, and the former No. 1 Tailings Dam area (Murchison Park). A rehabilitation audit was conducted in January 2002 that details recent rehabilitation activity. The estimated total area disturbed by mining and milling operations was 0.3 hectares in the open cut and 8.0 hectares in the Bobadil tailings dam. The estimated total rehabilitated area at Hercules was 3.5 hectares. A total of 37.5 hectares of land have been rehabilitated during the last five years.

Community Relations

Positive relationships continue to be built with the community of Rosebery through regular community forums and regular visits to community members. The communication during the course of 2001/2002 was based on changes to the operation (in terms of the new surface decline and surface ore handling facility) and the current state of Pasmenco as the company goes through voluntary administration. A new mine/community newsletter was also established. A small number of formal concerns were highlighted by the community, including issues of noise and vibration. These were all resolved through both education and putting some restrictions on operating equipment working hours.

Hercules Resources Pty Ltd — Burns Peak

This company has undertaken contract operations centred on the Rosebery northern open cut. A total of 250 metres of diamond drilling was completed and work commenced to extend the open cut on a small probable reserve of 5400 tonnes at 11.5% Zn. Production for the year totalled 4600 tonnes at 0.36% Cu, 7.0% Pb, 18.4% Zn, 220 g/t Ag and 7.21 g/t Au. Waste stripping amounted to 50 000 cubic metres. Two people were employed in the operation.

Zeehan Zinc Limited — Comstock mine development

No mining of ore or waste removal has been carried out, with earthmoving operations being directed at rehabilitation of the central waste rock dump. Approximately 14 000 tonnes of waste has been moved in total in this development. A gravity treatment plant was constructed at a cost of \$1.6 million. Aurora Energy has installed a five kilometre long 22 kV transmission line from Zeehan.

Personnel

A total of 67 people, including contractors, casual and temporary workers, were employed during the construction period.

Reserves

Zeehan Zinc is currently reviewing all work completed by Renison Goldfields Consolidated and Western Metals. These companies calculated resources along the Balstrup Fault of six million tonnes at 5.5% Zn, 3.3% Pb and 40 g/t Ag and 5.1 Mt at 4% Zn and 2.3% Pb respectively.

COPPER

Copper Mines of Tasmania Pty Ltd — Mt Lyell mine

CMT reports that it remains committed to the continued operation of the Mt Lyell site. With the further investment of capital in 2001/2002, there has been an improvement in the cost per tonne of copper produced. This strategy will continue as the operation tries to lower its cost base so that it does not become adversely affected by major changes in the copper price.

Production

Production from the Prince Lyell mine was 2 695 485 tonnes at 1.26% copper, an increase over the preceding year. Waste mined totalled 93 624 tonnes. A total of 2 720 483 tonnes of ore was processed producing 110 168 tonnes of copper concentrate grading 28.74% Cu containing 31 661 tonnes of metal. Recovery was 92.54%.

A total of 215 metres of decline development was carried out. A further 566 metres was advanced in the year to complete the decline bypass which is 1175 metres long. The company decided to suspend development in December 2001 in response to a seven month decline in copper prices. Development recommenced in April 2002, with a planned development advance of 2900 metres in 2002/2003.

Milling performance of the plant improved substantially with the installation of an additional 100 cubic metre flotation cell in August at a cost of \$557,000, and a regrind mill in November at a cost of \$603,000. As a result, the copper recovery increased from 91.41% to 92.54 % and concentrate grade increased to 28.74%. The operation is consistently achieving higher copper recovery.

Employment

The operation employed 229 people. CMT directly employed 93 people, 14 in the mine, 36 in metallurgy, 28 in maintenance and 15 in administration. The largest contractor was Barmenco, which employed 126 people in underground mining, crushing, mobile maintenance and administration.

Rehabilitation and pollution control initiatives

Surface drainage improvements have been completed to reduce the loss of solids from the site during periods of rainfall. Settlement dams have been constructed at the mill, tailings pump station and shaft, and cut-off drains have been constructed along the overland conveyor.

The acid drainage treatment system has been improved to allow more acid drainage to be co-treated with tailings. Up to 15% of the weekly Cu load pumped from the Prince Lyell mine has been treated, with a 12 month average of 4%.

Improved monitoring of acid drainage loads leaving site has been implemented by the installation of continuous monitoring equipment in Haulage Creek. This site

will provide 24-hour coverage of discharges, and is available for external access by the Department of Primary Industries, Water and Environment and Hydro Tasmania.

Optimisation studies of the Princess Creek tailings dam, to improve tailings storage capacity and discharge water quality, have commenced, and will be completed prior to September 2002. Results of associated water quality studies indicate that high-suspended sediment loads are inherent within the dam design and operation. Changes to the tailings management strategy are being investigated to reduce total suspended solids levels.

Reserves

Ore resources at 31 March 2002, at 1% Cu cutoff, were 34.81 million tonnes at 1.36% copper and 0.36 grams per tonne gold. The ore reserve to the 1540 metre level comprised:

Proven stope	5.16 Mt @ 1.30% Cu, 0.35 g/t Au
Proven development	0.19 Mt @ 1.14% Cu, 0.32 g/t Au
Total proven	5.35 Mt @ 1.30% Cu, 0.35 g/t Au
Probable stope	0.54 Mt @ 1.31% Cu, 0.35 g/t Au
Total Proven and Probable	5.89 Mt @ 1.30% Cu, 0.35 g/t Au

Capital expenditure and projects

The decline bypass and commissioning improvements in the processing plant were the major projects completed. Total capital expenditure was \$4,104,000. Major expenditure during the year comprised:

- Decline bypass — \$1,957,640
- Mine development — \$628,920
- Escapeway 1590 to 1565 — \$70,460
- Regrind mill — \$60,010
- Flotation cell — \$55,040
- Mine water line — \$45,560
- Grinding circuit automation — \$16,550
- Other — \$8,750

Gold

AurionGold Limited **— Henty mine**

In December 2001 Goldfields Limited merged with Delta Gold Limited to form AurionGold Limited.

Production from the Henty mine was 223 832 tonnes at a head grade of 12 g/t gold. Waste hoisted totalled 133 674 tonnes. Concentrator throughput was 224 252 tonnes producing 81,064 ounces of gold and 34,664 ounces of silver. Recovery was 95.5%.

Barmenco commenced a contract to carry out mine development, with development being advanced 2475 metres. One 2.4 metre diameter ventilation rise was completed and the second ventilation rise was reamed to 3.1 metres diameter.

Employment

The company employed 218 people including 125 contractors. These comprised 104 people engaged in mining, 36 in surface production, 66 in services and 12 in administration.

Reserves

The Mt Julia and Darwin ore bodies were added to the ore reserve.

Proven reserve	58 000 tonnes @ 11.8 g/t Au
Probable reserve	1 351 000 tonnes @ 10.3 g/t Au
Measured + indicated resource	1 624 000 tonnes @ 10.8 g/t Au
Inferred resource	1 999 000 tonnes @ 7.6 g/t Au

Exploration expenditure on site totalled \$12.294 million.

New developments

A rising main and substation was completed for Mt Julia. Work has commenced on designing the new high density paste fill plant. The Newton tails dam was constructed and the first lift was completed. Capital expenditure totalled \$1.954 million on mine development and \$2.474 million on plant and equipment.

Beaconsfield Mine Joint Venture — Tasmania mine

Ore production from the Tasmania mine was 190 247 tonnes at 15.38 g/t gold. Waste mined and hoisted totalled 119 009 tonnes, with 76 620 tonnes of waste being placed as backfill. Gold production totalled 90,468 ounces (2814 kg).

The operation employed 125 people, with 68 employed in mining, 38 in processing, eight in technical services, and eleven in administration. Approximately 40 contractors were also employed.

Reserves and resources

At 30 June the total reserves and resources were estimated as:

Proven reserve	170 000 tonnes @ 15.9 g/t Au
Probable reserve	710 000 tonnes @ 16.7 g/t Au

The total reserve is anticipated to deliver 0.91 million tonnes at 15.1 g/t gold to the processing plant.

Measured resource	120 000 tonnes @ 25.5 g/t Au
Indicated resource	520 000 tonnes @ 24.3 g/t Au
Inferred resource	260 000 tonnes @ 12.0 g/t Au

Exploration

No exploration took place on joint venture tenements during 2001/2002. As at 30 June 2002 negotiations were well advanced on the establishment of an Exploration Agreement that would result in Diamond Ventures NL of Sydney gaining exclusive access to joint venture tenements, outside an exclusion zone around the existing operation, for the purpose of exploration. The agreement was subsequently executed on 30 September 2002 and work on the ground will commence immediately.

Development

A total of 4600 metres of full-face waste development was completed during the year. This includes both capital and other development and included 208 metres of vertical development.

Major projects

The mine traded in Administration throughout 2001/2002. The focus, through the latter half of the year in particular, was the initiation and completion of a number of capital projects, which would provide a stable platform for ongoing profitable trading to retire debt. Major projects included:

- ❑ Completion of mine dewatering infrastructure upgrade including the construction of a new pump station at 680 mL, installation of a new rising main below the 500 metre level, construction of a settler and associated works.
- ❑ Completion of an 8000 metre diamond drilling program to delineate the orebody to 1050 metre level.

- ❑ Construction of a further three metre lift on the tailings dam.
- ❑ Installation of an in-stream sulphur analysing system at the processing plant.
- ❑ Purchase of an inventory of critical spare parts across the underground mine and processing plant.

Environment

Environmental monitoring has continued in areas of noise and dust control and water quality. Regular maintenance has been carried out at the wetlands and around the mine site. Work commenced on the establishment of an Environmental Management System. An environmental induction program, including the induction of all current employees, has been developed. A statutory environmental audit was undertaken by an independent consultant, and reporting to the National Pollutant Inventory was also completed.

Although Allstate Explorations NL is not a signatory to the *Australian Minerals Industry Code for Environmental Management 2000* the mine is operated under the code and aims to achieve the guidelines outlined therein.

Tin

Renison Bell Limited — **Renison mine**

The Renison tin mine operated under financial difficulty during the 2001/2002 year. A summary of mining, production and employment is provided as follows:

Mining: Ore mined at Renison totalled 641 477 tonnes.

Production: 12 363 tonnes of tin concentrate at 59.5% Sn were produced.

Production Sales: Sales of tin concentrate totalled 12 295 tonnes.

Employment: Renison's average employment figure totalled 180, including contractors.

Iron ore

Australian Bulk Minerals — **Savage River mine**

Production at the open cut mine at Savage River totalled 4 881 025 tonnes of ore mined and 20 801 536 tonnes of waste stripped. Mill production totalled 2 200 284 tonnes of concentrate, with the Port Latta plant producing 2 151 637 tonnes of iron ore pellets. Shipments included 2 088 507 tonnes of pellets, 33 013 tonnes of concentrate and 55 924 tonnes of iron ore chips.

The company employed 428 people, including 162 contractors. Of these 178 were employed in mining, 94 in milling, 136 in pelletising and 20 in administration.

Environment

Contract weed management was undertaken within the former Savage River township on behalf of the Department of Primary Industries, Water and Environment. This included management of broom, cotoneaster, pampas grass and gorse.

In situ classification and segregation of waste rock from pits was practised to prevent oxygen from reaching potentially acid-forming waste rock. Dumping of potentially acid-producing rock occurred in clay-lined waste rock cells above the Broderick Creek flow through and in selected areas above B Dump. This included waste from North Pit and South Deposit. South West Dump was revegetated with a sterilised rye grass, with further seeding and hydromulching to occur during the latter half of 2002.

A water shedding cover was placed over B Dump by covering it with clay and non-acid forming waste. Compaction trials established the maximum efficacy for this operation. The final slope of this dump to shed water from the acid producing material beneath is to be established through use of the soil cover model.

Revegetation of land to the west of the Port Latta site continued, with weed management and replanting. ABM has continued to co-fund a Coastcare program

which is developing a coastal management plan for the northern section of the Rocky Cape to Stanley east corridor.

Ore reserves

Proved and probable ore reserves as at 30 June 2002 were 88 102 384 tonnes @ 50.9% DTR. Mineral resources as at 30 June 2002 comprised:

Measured	— 75 904 404 tonnes @ 52.3% DTR
Indicated	— 69 483 060 tonnes @ 51.5% DTR
Sub total	— 145 387 464 tonnes @ 51.9% DTR
Inferred	— 81 614 817 tonnes @ 51.8% DTR
Total	— 227 002 281 tonnes @ 51.9% DTR

Over the year resource drilling was carried out in South Deposit, Centre Pit and North Pit.

Major projects

A second primary crusher and conveyor was installed to crush ore from the newly developed South Deposit.

The tailings dam wall was raised over the summer with a four metre upstream lift. A section of the Corinna Road was also re-routed at a higher elevation as the old road was due to be flooded after the tailings dam wall was raised.

A major contract for the supply of gas to Port Latta was signed. At the time delivery was expected in July 2002. Gas will replace bunker oil currently used in pelletising and will bring both economic and environmental benefits to the process.

Capital expenditure

Total capital expenditure for the year was \$19.9 million. Major items included:

Diamond drilling	\$1,105,000
Control system upgrade	\$1,034,000
Raise tailings dam	\$1,152,000
Gas conversion	\$1,022,000
Southern Deposit crusher	\$5,911,000
Ship loading terminal conveyor	\$1,134,000

Tasmania Mines Limited — Kara mine

This company operates an open-cut mine for scheelite and magnetite at Kara, south of Burnie. This is the only operating tungsten mine in Australia and continues to produce high-grade scheelite for export.

Production for the year totalled 56 280 tonnes of dense medium magnetite, 1429 tonnes of magnetite fines and 33 tonnes of high-grade scheelite @ 75% WO₃. A total of 109 066 tonnes of ore and 177 160 tonnes of waste was mined.

The operation employed 19 permanent and one casual employee. Eleven contractors and consultants are employed as required.

An Environmental Management Plan for the site is currently under review by the Department of Primary Industries, Water and Environment.

An 11' × 5' Centrix ball mill was installed during the year in the dense medium magnetite production circuit.

The company continues to increase its share of the Australian dense medium magnetite market in Tasmania, New South Wales and Queensland. Prior to the company supplying coal washeries with this product, Australia was importing magnetite from overseas.

Reserves and resources

The measured mineral resources in Kara No. 1 Pit as at 31 December 2001 comprised:

- Fresh scheelite and magnetite-bearing ore: 135 000 tonnes @ >30% Fe, 0.54% WO₃;
- Fresh magnetite-bearing ore: 1.52 million tonnes @ >30% Fe
- Total magnetite-bearing ore: 1.655 million tonnes @ >30% Fe

Industrial Minerals**Limestone and dolomite****Beams Bros Pty Ltd**

This company operates a limestone quarry at Frankford and a dolomite quarry at Cressy. Twenty-four people were employed in operations. Production for the year comprised:

Limestone flux	12 588 tonnes
Dolomite for flux	48 264 tonnes
Limestone for drains, water treatment	8 257 tonnes
Fines: limestone and dolomite	79 350 tonnes
Ironstone gravel	1 846 tonnes
Dolomite by-product	4 573 tonnes
Scalpings	1 146 tonnes
Limestone for mixing	2 973 tonnes

Extensive reserves exist at Flowery Gully but reserves at Cressy require more drilling. At Cressy 30 000 cubic metres of overburden was stripped and development is in progress on the eastern side of the pit. Part of the waste stockpile was spread with topsoil in preparation for tree planting.

At Flowery Gully 18 000 cubic metres of overburden was removed on the western side of the pit. Rehabilitation work included the planting of 1000 trees around the quarry and crusher, with another 4000 plantings planned for the area behind the quarry.

Circular Head Dolomite and Trading Co. Pty Ltd

This company operates a quarry for dolomite and a concrete plant at Smithton. Production totalled 6860 tonnes of screenings, 39 718 tonnes of powdered dolomite, and 13 891 tonnes of readymix concrete. Waste stripped totalled 1000 tonnes.

Dolomite has been drilled to 1000 metres over the area of the mining lease, which covers 120 hectares.

A new crushing plant and storage shed have been completed. A JCB spreader and concrete truck have been purchased. The company is exploring an opportunity to ship dolomite to the mainland States.

David Mitchell – Tasmania

This company operates a limestone quarry and calciner near Mole Creek to produce lime.

Production for the year totalled 123 600 tonnes of limestone, which included 13 900 tonnes of crushed rock, 1100 tonnes of screened rock, 51 000 tonnes of agricultural limestone, and 57 400 tonnes of calciner feed rock. Waste rock stripped and moved to dump totalled 408 100 tonnes. The operation employed 28 people.

Reserves

Reserves of 1.4 million tonnes of high quality and 1.3 million tonnes of medium quality limestone have been exposed. Further analysis will be conducted in lower levels of the quarry. Whole of life stripping ratio is 3.6:1. Low quality stone has

been approved for use as agricultural limestone and feasibility work on a new agricultural lime plant was undertaken.

Capital expenditure

A drill rig was purchased at a cost of \$220,000. Work was completed on the first stage of an electrical upgrade at a cost of \$180,000 and approval was given for the second stage and accommodation improvements.

Environmental

Stack emissions testing was carried out and verified compliance at normal operating levels. Work continues on addressing compliance at elevated kiln production levels.

Ceramics

K & D Bricks and Pavers

Production of clay bricks and pavers continued at the New Town plant.

Nubrik Pty Ltd, Longford operation

Production of bricks and pavers was 22 346 tonnes or 9.75 million units. In excess of five million bricks and pavers were sold to overseas and interstate customers. Japan and Korea are the major markets, with product also sold in New Zealand, United Arab Emirates, Singapore and Italy. Local demand has also been strong.

The company employed 25 full-time, 10 casual and two cartage contractors. The Longford plant achieved seven years free of lost-time accidents in December 2001.

Rehabilitation work included the battering of pit faces at Wilmores Lane, Longford. Reserves of material at all pits is adequate for in excess of 15 years.

Construction Materials

Brambles Industrial Services

Brambles Industrial Services operates quarries at Western Junction, Ridgley, Talisker, Birralee and Pipers River. Total production for the year was 366 684 tonnes, of which 40% was road base and sub-base material, 25% comprised products for the road surfacing industry, whilst a further 15% was produced to service the concrete industry. The remaining 20% of production included slab fill, specialised drainage products, and rock for engineering or decorative purposes. A total of 83 000 tonnes of overburden materials was removed, the majority of which was processed for sale as unsealed road base product. Product sales for the 2001/2002 period totalled 348 578 tonnes.

Employment

Thirteen people were employed in Brambles quarry operations during the year, including operators, supervisors, administration personnel and contractors. All Brambles quarry employees made progress towards post-secondary qualifications during the year, specifically Certificate 3 in extractive industries (operators) and Certificate 4/Diploma in Business Administration (administration personnel). All employees and contractors received training in working at heights and confined spaces entry.

Capital expenditure

The purchase of a new wheel loader for the Western Junction quarry operation was the only significant item of capital expenditure for the year.

Rehabilitation / environmental

Ongoing improvements were made to water sprays and other dust suppression measures whilst improvements were made in the management of stormwater runoff at the Western Junction and Ridgley quarries. Scheduled rehabilitation works occurred at selected sites.

Caroline Quarries

Production from the Railton quarry comprised 19 190 tonnes of silica sand and 1607 tonnes of road and concrete gravel and sand. Four people were employed permanently or part time.

Approximately 500 metres of topsoil was stripped and stockpiled in preparation for another bench. Rehabilitated areas of the quarry are progressing well.

Duggans Pty Ltd

This company reported an annual production of 51 541 tonnes of road aggregates and 20 645 tonnes of concrete products from their Cradoc operation. A total of seven people are employed in operations and administration.

Continuing improvements to the sediment dams and ongoing rehabilitation to benching are being carried out. Dust control includes continued monitoring of water addition during production and installation of a large cyclone which works in conjunction with water control. Recycling material dredged from the concrete batch plant wash out pit is being used in other products.

A truck and excavator were purchased during the year.

Gunns Limited

This company reported that 20 400 tonnes of gravel was extracted from its pits for roadworks in forestry operations. Gunns operates twenty-eight pits, ten of which are on private land.

Hobart Blue Metal Industries

HBMI employed 18 people in its quarrying operations at Leslie Vale. Production was reported to be 341 100 tonnes of crushed rock and 22 400 tonnes of gravel. Minimal capital expenditure was made with minor upgrading of the plant. Minor rehabilitation work continued.

Island Resources

This company reported that production totalled 97 044 tonnes, with the principal products being road gravel (34 900 tonnes), concrete sand (22 700 tonnes), and foundry sand (16 700 tonnes). Approximately 4000 tonnes of waste material was handled. Four people were employed in the operation. Reserves are approximately 50 million tonnes of sand and 2.9 million tonnes of road gravel.

Capital expenditure has included the purchase of a new loader at \$196,000 and a steam cleaner valued at \$4,000. Sealing the road around the weighbridge and office areas to improve dust control cost \$6,000. Planning for a fines recovery system to upgrade the washing plant has commenced.

Rehabilitation continued with plantings of *Eucalyptus rodwayi* seedlings.

Fieldwicks

This company produced 92 566 tonnes of road making material and 75 520 tonnes of blue metal, drain rock, sand and landscape material. Seven people were employed in the operation. Capital expenditure on new screening, crushing and loading equipment exceeded \$1.7 million.

Industrial Sands and Silica Pty Ltd

The company employed eight people including contractors. Production totalled 14 021 tonnes, of which 11 688 tonnes was road gravel. Reserves of gravel and other deposits have not been accurately determined but have been estimated at 20 000 tonnes.

A gravel pit has been backfilled following completion of extraction and top soil is being spread in readiness for planting a selection of native vegetation. A new entrance into the operation has been constructed as part of a rehabilitation program and in response to discussion with neighbours. The pit has been fenced and soil has been spread on regraded batters.

**Norske Skog Paper Mills
(Australia) Limited**

This company produced 101 958 tonnes of road building materials for its forestry operations. Small volumes of stripping were stockpiled at the Bannisters, Blue Gum Knob, Leasons and West Uxbridge quarries. A total of 14 people were employed, including contractors.

The Styx to Uxbridge link road has been completed during the last two years, with approximately five kilometres of road being built to make this link viable. The road has improved road transportation of timber to the mill and the movement of equipment without the need to use public roads. Approximately 30 km of new roads were built in 2001/2002 in areas where harvesting operations are scheduled to commence in 2003.

The major quarries (Bannisters, Blue Gum Knob, Dora, Jones, Leasons, Maynes, McKays, Misery, Mt Lloyd, Mystery, Newbury, Plenty, Puzzle, Stormlea, Wayatinah, West Uxbridge and Woolleys) have a useful life expectancy of 10–15 years at the current rate of road construction.

The company has an annual budget of \$30,000 towards rehabilitation works. This includes levelling of floors, benches, planting of trees, shrubs, and fertilising areas in quarries which have no further production of gravel materials available.

Rehabilitation work has been completed in the Holmes Road, Shoobridges and Strettons quarries. Rehabilitation is progressing at the Junee, Liapootah, Lower Nive, Rayners and Silvagra quarries.

**Pioneer Construction
Materials, Hobart quarry**

Production of concrete, cement block, asphalt aggregates and road-making materials increased over the amount produced in 2000/2001. A total of twelve people were employed in the operation.

Overburden stripping of RL235 has been stockpiled for future rehabilitation work. Rehabilitation continues in all areas with a focus on eliminating pampas grass. Spray bars were fitted to the sub base conveyor stockpile area to control dust emission. As there are no major development projects on the horizon in southern Tasmania the quarry has been supplying small subdivisions and local council projects.

**RNB Trading Pty Ltd
(Sanbar Pty Ltd)**

The production of sand from South Arm comprised 65 845 tonnes for use in asphalt and concrete sand and 470 tonnes for filling and bedding. A total of 13 500 cubic metres (19 600 tonnes) of bedding sand was produced for the gas pipeline in conjunction with Tasberry Holdings Pty Ltd at Kempton.

Stornoway Quarries Pty Ltd

Stornoway operate five quarries in northern Tasmania, producing pavement materials and some structural fill material. Production for the year totalled 136 882 tonnes, with about 58 000 tonnes coming from the Frankford quarry and 72 000 tonnes from the Raeburn quarry. Reserves of material at all quarries totals about 2.75 million tonnes. Six people were employed in the operations.

Environmental management system

The company operates within a third party certified integrated management system incorporating ISO9002, ISO14001 and AS4801. This system has been place for a number of years.

Fuel minerals

Cornwall Coal NL

Duncan Colliery

Production continued at the Duncan Colliery throughout the year, with a total of 170 040 tonnes of coal being mined using a combination of development and extraction techniques. The system adopted for extraction proved very successful, with no adverse events. Regular strata control audits and mapping were undertaken to ensure safe conditions were maintained.

Blackwood Colliery No. 2

This colliery has remained sealed through the year with regular monitoring of atmospheric conditions behind the seals. The atmosphere quickly became inert with oxygen levels of 4% and less. The predominant seam gas recorded is carbon dioxide.

Blackwood Colliery No. 3

Pillar extraction was maintained throughout the year with a total of 337 700 tonnes being mined. The extraction system used at the Duncan Colliery was adopted at Blackwood with immediate benefits being apparent in strata control and output. Pillar extraction was successfully maintained with no adverse events.

Huntsman No. 2

Production from the open cut continued until Christmas 2001 when the reserves were exhausted. Re-contouring work was conducted prior to a seeding program being implemented. A total of 16 630 tonnes was mined during the year.

Cullenswood open cut

Production commenced in January 2002 with overburden removal prior to extracting a 1000 tonne test sample. The sample proved successful in both washing characteristics and quality. Overburden removal continued, with 15 450 tonnes being mined.

Production

Production for 2001/2002 totalled 539 820 tonnes. This coal was sourced from:

Blackwood No. 3	337 700 tonnes
Duncan	170 040 tonnes
Huntsman No. 2	16 630 tonnes
Cullenswood	15 450 tonnes

An additional 3749 tonnes of coal was purchased.

Washery throughput of raw coal totalled 523 679 tonnes to produce 387 158 tonnes of saleable coal at a washery yield of 73.93%. Coal sales totalled 382 027 tonnes. Washery reject stockpiled at Duncan totalled 136 521 tonnes.

Employment

A total of 84 people were employed including contractors. This total comprised 46 people employed underground, twelve in processing, nine in administration, and 17 contractors in coal cartage and the open cut. Two lost-time injuries occurred at the washery.

Reserves

Investigation into the reserves at Duncan, together with a critical appraisal of the operations, highlighted that the consolidation of underground mining activities into one mine will have beneficial effects to the company. Plans were devised to amalgamate underground mining activities within the Duncan Colliery from September 2002. Duncan will be exhausted in 2007 with work commencing on a new underground mine within the Blackwood complex called Blackwood 4, which will mine the Fenton Lower Seam.

Capital expenditure

A total of \$320,000 was expended on plant and equipment during the year, with \$300,000 being used to purchase a second-hand breaker feeder and \$11,000 being used to acquire two second-hand surface transformers.

Rehabilitation

Huntsman open cut was contoured prior to a seeding program being implemented. Topsoil at the Cullenswood site was removed and stockpiled for later rehabilitation purposes.

Mineral processing operations

Australian Cement Holdings Pty Ltd

Production at the Railton cement factory totalled 1.070 million tonnes of clinker from which 1.257 million tonnes of cement was produced. From this production a total of 1.160 million tonnes was shipped to Victoria and NSW, 1.140 million tonnes via Australian Cement's bulk cement carrier MV *Goliath* and the balance moved on the MV *Yarra* through the Port of Devonport. The remaining production was sold locally as bulk product for the Tasmanian market (73 000 tonnes), or bagged for both the mainland and Tasmanian markets (36 000 tonnes). Total cement despatched from the Railton factory, at 1 269 625 tonnes, was an all time record.

Raw materials consumption comprised 1.63 million tonnes of limestone and 73 300 tonnes of clay extracted from the company's quarry. In addition 13 600 tonnes of iron oxide in the form of iron pellet chips, 20 500 tonnes of silica sand, 64 200 tonnes of gypsum and 162 600 tonnes of coal were purchased to achieve the yearly cement production.

Employment

A total of 148 people, including five contractors and 19 part-time employees, are involved with the mine and plant operations. A further 18 people, including one contractor, are involved with Group Administration and Information Services and local marketing functions, resulting in a total of 166 employees on site.

Capital expenditure

A total of \$5.9 million capital was approved during the year. Of this \$3.8 million was for an upgrade of the kiln coal processing plant. Improved reliability of this plant and a significant improvement in the overall environmental performance of the factory is expected on completion of this project. A further \$1.7 million was approved for a large number of smaller capital replacement projects and the remainder for cost reduction projects.

Rehabilitation and environmental initiatives

Rehabilitation work for the year included seeding of overburden dump banks and some minor repair work to existing areas in the new mine site.

Environmental incidents continued to be closely monitored, with a slight increase over the previous twelve months partly a result of more stringent reporting procedures introduced. Capital expenditure on the coal processing plant is expected to significantly reduce the number of incidents.

Other initiatives include the continued development of the site Environmental Management System and the Greenhouse Energy Management System.

Development

A total of 510 000 banked cubic metres of overburden was removed as part of the ongoing development of the mine site.

Comalco Aluminium (Bell Bay) Limited

This company operates an electro-metallurgical aluminium smelter at Bell Bay in northern Tasmania. The operation employs 583 direct employees and 144 contractors. Aluminium shipped during the year totalled 161 948 tonnes.

Total capital expenditure for the year was \$35.2 million. Major projects undertaken included:

- ❑ Rodding room upgrade, which will result in a complete refurbishment of a key process area. The investment in new technology will reduce process variation and equipment downtime, while eliminating the need for manual intervention. The upgrade is also expected to further reduce the amount of particulate dust emitted by the site.
- ❑ Cell tending machines have been progressively installed across each of the smelter's three potlines. The state-of-the-art technology will remove the need for manual anode setting, reducing the potential for manual handling injuries such as sprains and strains, and vastly improving the working environment.
- ❑ Gas conversion of the carbon baking plant from heavy fuel oil to natural gas. While commissioning only commenced in August 2002, much of the preparation and laying of the pipeline occurred during the 2001/2002 financial year.
- ❑ Commissioning of the \$12.5 million dry scrubbing facility to treat fumes generated by the carbon baking furnace was completed in December 2001. The scrubber has, to date, performed to design specifications and resulted in a 99% reduction in fluoride emissions from the carbon baking furnace and a further 24% overall reduction in site fluoride emissions.

Impact Fertilisers Pty Ltd

Impact Fertilisers imports phosphate rock to manufacture single superphosphate and high analysis fertilisers to blend to market requirements. A total of 205 000 tonnes of single superphosphate was produced. The operation employs 90 people. Major projects in progress include a scrubber plant upgrade and an effluent handling system.

Pasminco Hobart Smelter

The operation at Risdon employed 562 people, including six full-term contractors. A total of 251 668 tonnes of zinc was produced, comprising 115 337 tonnes of Special high-grade zinc, 108 335 tonnes of Ezda zinc, and 27 996 tonnes of other alloys.

By-products produced comprised 38 376 tonnes of leach residue, 124 055 tonnes of paragoethite, 1929 tonnes of copper sulphate, 315 tonnes of cadmium, 4914 tonnes of crude dross and 431 471 tonnes of sulphuric acid.

Capital expenditure during the year totalled \$10.55 million. Major projects included the Risdon substation replacement, acid plant, and electrolysis improvements.

Tasmanian Electro Metallurgical Co. Pty Ltd (TEMCO)

This company operates an electro-metallurgical smelter at Bell Bay. The operation employs 275 direct employees and contractors in production and administration.

Production for the year totalled 73 258 tonnes of ferromanganese, 138 939 tonnes of silicomanganese and 208 986 tonnes of sinter. Sales totalled 85 289 tonnes of ferromanganese, 141 107 tonnes of silicomanganese and 17 246 tonnes of sinter.

Rehabilitation and environmental control

- ❑ A study to incorporate *Xanthorrhoea australia* into revegetation at Beaconsfield continued.
- ❑ The use of clay overburden as subsoil for revegetation is being trialed on historically disturbed areas on the western flanks of Cabbage Tree Hill, near Beaconsfield.

- ❑ TEMCO is a signatory of the *Australian Minerals Industry Code for Environmental Management 2001* and our progress towards implementation is being addressed through continued certification to ISO14001.
- ❑ The ambient manganese soil sampling is complete and results show TEMCO to have little impact in the region, with dolerite contributing similar levels of manganese to soils.
- ❑ Environmental acoustic modelling is in progress.
- ❑ Performance of the electrostatic precipitator has been improved by removing mixed raw material spillage from the feed as part of the dioxin minimisation program.
- ❑ Fugitive fume emissions from furnace No. 1 have been reduced as part of a rebuild conducted during the year.

Capital expenditure

Capital expenditure for the year totalled \$7.108 million. Major items were:

- ❑ Number 3 fume dam construction: \$2,000,000
- ❑ Automation of raw materials handling system: \$560,000
- ❑ Purchase of a replacement 110/220 kV distribution transformer: \$712,000

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

Mineral Resources Tasmania administers the Rehabilitation of Mining Lands Trust which was established by the proclamation of the *Mineral Resources Development Act 1995*. The State, with the support of the mining and quarrying industries, allocated a set percentage of mining royalties for rehabilitating Crown Land affected by historic mining disturbance. A total of \$458,000 was spent on this program during 2001/2002, including \$98,000 carried forward from 2000/2001. The major programs for the year were erosion control works near Gladstone and rehabilitation of an open-cut coal mine at Merrywood.

Northeast Tasmania tin mines

The program undertaken in the last financial year concentrated on further erosion control and revegetation work at the abandoned Endurance tin mining site at South Mount Cameron in northeast Tasmania. The project was managed by MRT, with a local site supervisor engaged to conduct day-to-day management of the project. In addition to the earthmoving contractor, locals were employed on a regular basis to provide the manual labour for the project. Safety equipment, first aid and chainsaw operation training were provided where necessary.

Work continued in the Cat Gully area and at a site a little to the north, categorised as the 'N2' area. At both sites further actively-eroding gullies were treated to arrest the progression of erosion into adjacent stable ground and established vegetation.

Earthworks involved contouring the gullies by battering the sides to provide a suitable surface for revegetation. Cut-off drains, restricting the amount of surface run off entering these systems, were excavated and geotextile and rock-lined spoon drains were established to control any water flow through the modified gully profile. The slopes were covered with clean straw and jute to inhibit further erosion in the short term, followed by the application of fertiliser and local provenance seed to establish a vegetation cover.

An additional ten hectares of ground affected by past tin scraping, adjacent to the Cat Gully area, was scarified, fertilised and seeded to stimulate existing regrowth and establish new cover in sections currently devoid of vegetation.

Trial revegetation plots were established on an area of tailings at Endurance to provide some knowledge of suitable techniques that may be applied in future programs.

A tourist viewing area was constructed at the Blue Lake in partnership with the Parks and Wildlife Service. This project, adjacent to the Gladstone–Pioneer road, was considered important as no 'safe' viewing point had previously been provided to cater for the increasing number of visitors to this site.

Merrywood Colliery

The Merrywood site was recently abandoned and covers approximately fifty-five hectares. Nigel Bedford and Land Management and Rehabilitation Services Pty Ltd drafted the rehabilitation plans. The Break O'Day Council granted development approval. Becketts Heavy Plant Hire Pty Ltd carried out the regrading, covering washery fine tailings,

and cultivation. Woodland Corporation Pty Ltd carried out the revegetation. Native grass seedlings were planted and locally gathered seed was sown. Spot seeding of steep areas was undertaken and Conservation Volunteers Australia carried out gorse control.

Aerial fertilising was ordered but delayed by changing weather and will be carried out in 2002/2003.

Storys Creek

Preparation for the jig tailings relocation in 2002/2003 was the main activity for the year. The Northern Midlands Council granted development approval. A successful application was made to the Natural Heritage Trust, through the RiverWorks Tasmania program, to obtain \$255,000 of financial support from the Commonwealth. Contract drafting was done in preparation for calling earthmoving tenders.

Program consultant, John Miedecke and Partners Pty Ltd, reported on sampling in preparation for limestone additions to Storys Creek. Four hundred tonnes of limestone was spread into the creek to combat acidity and the dissolution of metals in the watercourse.

Safety work and weed control

Protection work was carried out at seven shafts and open stopes at the Argent mine at Zeehan. Two sites were filled, one was capped with concrete, and four were capped with galvanised steel grating. Thompson and Brett Pty Ltd undertook the engineering design with construction carried out by The Engineering Company Pty Ltd. The program was carried out in conjunction with the Zeehan Community Council, which is developing this area for tourist access.

Gorse spraying was carried out at the Queensberry mine near Zeehan. The work was done in partnership with the Parks and Wildlife Service.

At Bangor, near Lilydale, a shaft was capped with galvanised steel grating. Pitt and Sherry Pty Ltd undertook the engineering design with Schouten Concrete Pty Ltd carrying out the construction.

Smaller shafts in State Forest at Lefroy and near Railton were filled.

Quarry rehabilitation

A further stage of rehabilitation was carried out at gravel pits near Beaconsfield. Work comprised cultivation, spreading topsoil and excavation of drainage controls.

Planning was carried out for rehabilitation of the Badger gravel pits near Sheffield. Seed collection was completed.

Crown Land

Rehabilitation of the New Harbour mine was carried out. This site is located at Melaleuca, near Bathurst Harbour in Tasmania's far southwest. The work was done by the Wilson family who mine in the area.

The Parks and Wildlife Service were reimbursed for drainage and erosion control works on an old exploration track in the Lake Johnson Nature Reserve on Mt Read near Rosebery.

Tasmanian acid drainage reconnaissance

Trust funds were used to complete statistical analysis of water sampling data and the preparation of poster papers for the dissemination of the results of the program.